





## Second magazine makes Acorn see red

by John Kavanagh  
A SECOND magazine is in trouble with UK microcomputer firm Acorn Computers for showing how to copy programs from cassette tape to disc. But this time there is an extra twist, for the magazine, *Acorn User*, is being taken over by a publishing company part-owned by Acorn founder Chris Curry.

In December Acorn took *Personal Computer World* to the High Court to prevent it publishing a similar article. The magazine paid £65,000 in an out-of-court settlement and was then able to sell the issue.

But *Acorn User* had already been distributed before Acorn heard of its article.

"It was too late for us to do anything about it," says David Johnson-Davis, managing director of Acorn's Acornsoft software subsidiary. "We are understandably upset about it. We have consulted our solicitors and we are now thinking about what to do."

These articles have appeared just as Acornsoft has introduced an offer to take back cassette versions of its programs in exchange for half-price disc versions.

The magazines point out that details of how to make the copies were already on the Microcrist 800 software and information service, available through the national Prestel videodata network.

Curry's new publishing firm, Redwood Publishing, has been set up with former *Daily Express* editor, Christopher Ward. It expects to have 10 journals by the end of the year.

Johnson-Davis says Curry's investment will not affect any Acorn action against *Acorn User*. And *Acorn User* editor, Tony Quinn says Acorn will have no influence over the magazine.



NIXON... "It is IBM's concern to play a closer role in higher education."

## IBM aims to flood the schools

by Philip Hunter

IBM UK has launched a multi-million pound programme to spread its name and computers through British schools and colleges, and IBM Europe is set to give away 1,300 Personal Computers to educational establishments.

IBM UK chairman, Sir Eddie Nixon, last week committed the company to a £3.2 million programme to help schools and universities develop computer-aided education, with further announcements expected to bring the investment up to at least £10 million over the next four years.

The main part of the initial programme is a £2 million joint project with Cambridge University's engineering department, to bring computers into the lecture theatre for applications like electronics blackboard and animation.

IBM is investing £2 million in this project over three years. It will spend £400,000 more giving away 92 Personal Computers to 67 selected colleges and polytechnics, plus a further £800,000 sponsoring projects involving the PC in schools.

The Cambridge University project is the first under IBM's recently announced "IBM Institute" programme and Nixon says that more such collaborative ventures will follow.

"It is IBM's concern to play a closer role in higher education," he says. But it is clear that the strategy is part of a worldwide programme to make students familiar

with IBM hardware, and therefore more likely to continue as IBM users afterwards. Cambridge University is already a big IBM mainframe user.

Other major computer-makers have recently moved to increase their share of the education market by announcing price cuts or giving away software. Apple and Commodore recently announced price cuts of around 30% to schools, while Research Machines is giving away around £2,000 worth of software to schools buying its network system.

Apple UK says it is considering a plan along similar lines to IBM's to establish itself in universities. "We would leave the application areas open to universities and perhaps offer a discount on our hardware," says a spokesman.

Apple's Lisa and Macintosh computers would be involved in the scheme, rather than the ageing Apple II, 2,000 to 3,000 of which have already been supplied in UK schools and colleges.

IBM has no scheme to collaborate directly with universities in development of computer-based course material, but for several years has been supporting individual research projects through its University Research Council. Like its competitors, the company is looking at ways of getting more computers into colleges, but has lost interest in the schools market.

ICL recently sold to Acorn a subsidiary that specialised in education software for schools.

## Lords speed through Cable Bill amendments

by our Parliamentary Correspondent

THE Lords have made a quick start to the committee stage of the Cable and Broadcasting Bill, getting through amendments to the first eight clauses in the first sitting.

But peers admitted that they did not understand many of the technical issues involved, and that parliament was really legislating, if not in the dark, then at least in the twilight.

Noble Lords confessed that they had very little knowledge of how cable operators would carry out their tasks. But Lord Elton, Under Secretary at the Home Office, said it was already clear that few programmes would be originated by the cable operators themselves. Programme services would be offered to cable operators on a national scale by a number of new companies or consortia, he said.

An indication of these companies which had banded together could be gained from the published list of 10 or 11 pilot projects approved in December 1983.

Elton gave Lord Aylestone a pleasant surprise by accepting his amendment to limit the size of the Cable Authority to no more than 10 members. Elton said that the Home Secretary had intended from the start to have just a chairman, deputy and five others.

Elton explained that only services broadly comparable with broadcast TV and radio would need a licence from the cable authority. Other services, closer to printed publishing than to television, like Prestel for example, would need no licence.

But they would still be covered by the general laws on obscenity and libel.

Elton described the idea of licensing printed newspapers as Orwellian, and said that it would be inconsistent to compel operators offering only electronic news to have a licence, and not newspapers.

The Lords was also at committee stage on the Telecommunications Bill. Opposition peer, Lord Bruce of Donnington, is trying to introduce a new clause to the Bill to provide for the setting up of a Telecommunications Council for referral of disputes arising from decisions taken by the Director of Telecommunications.

## Welsh sell US arm to terminal maker

by John Riley

APPLIED Digital Data Systems (ADDS), a leading US terminal manufacturer, last week bought Welsh company Data Type Terminals' US operation for \$700,000 and royalties.

ADDS will now manufacture and market Data Type's Auto-graph X-Series of Televideo and Tektronix compatible graphics terminals in the US. This will give ADDS the product it needs to take on its arch-rival, terminal maker Televideo.

"We have closed our US operation, transferred the staff to ADDS, and passed on our complete distributor network for the X-Series," confirms Gerry Tuffs, chairman of Cwmbran-based Data Type. The company has been selling 40 to 50 terminals to the US each month, but expects to gain from ADDS' sophisticated mass production facilities.

"Data Type gets \$700,000 as a lump sum and a royalty on each machine sold," adds Tuffs. "We have plans to develop jointly one and probably two new products based on Data Type's graphics expertise and ADDS product engineering."

However, Tuffs has not closed all his options in the US. He intends to continue to market an option board for Televideo graphics through a separate distribution network. Data Type will still manufacture terminals at Cwmbran for the UK market, which takes about 100 terminals a month. Ironically, the UK company is also Televideo's largest distributor in the UK.

David Laws, ADDS president and chief executive, says: "This is part of our strategy for acquiring product lines developed by others as technical platforms. We are looking for companies with good products, but which are faltering because of poor marketing."

Laws is using that strategy to expand into all sectors of the terminal market. Until now, ADDS, a wholly-owned subsidiary of NCR, has produced terminals using only teletype protocols. It recently moved towards the IBM 3270 compatible market with Viewpoint 78, which uses a separate converter.

ADDS systems division sold 30 hardware systems based on its own peripherals and Magnuson processors.

Meanwhile Ultimate was also selling distribution industry software on Digital Equipment minicomputers. And its success in the IBM compatible processor market led it into the IBM software business — which brought the takeover of Global Software.

Global specialises in general accounting packages and competes with big firms like Management Science America and McCormack and Dodge.

Ultimate had sales of \$3.2 million in 1983 — including \$3.2 million worth of Magnuson processors and Storage Technology peripherals. This year it expects to more than double that to \$31 million, with \$8.6 million worth of hardware.

"We are getting substantial development funds," says George Pilmans, head of Ultimate. "And we're looking for more products. We want to expand all sides of our business into Europe."

Magnuson was allowed to continue trading last year while sorting itself out — and Storage Technology became a big customer. In nine months the company's new

## Bristol opts out of software centre

by John Riley

BRISTOL University plans to opt out of the South West Universities Regional Computing Centre (SWURCC) at Bath, a major UK software and networking development centre. But it could miss out on government cash in the future.

Bristol has approached the Computer Board, which finances university and regional computer centres, about splitting off from the twin ICL 2980 mainframe facilities it shares at the independent centre with four other universities.

However, a questionmark hangs over what Bristol stands to gain by the move, as there is not enough cash in the kitty to boost its own local facilities. The situation also raises fresh fears about the long term future of SWURCC itself.

Last year SWURCC came under close scrutiny by a committee set up by the Computer Board, headed by Geoff Manning, director of the Rutherford-Appleton laboratory. The resulting internal report recommended that SWURCC should keep going but that it would have to lose staff.

The Manning report also dashed any hopes that SWURCC may have had about becoming a national computing centre like the two at Manchester and London. But it recommended that SWURCC should get £5 million from the Computer Board over the next 10 years.

SWURCC has many tie-ups with industry for contract research work. It was a pioneer in packet-switched networks and is currently working on several development projects for ICL, including building the Unix operating system into a VME environment.

Bristol is cagey about its reasons for wanting to leave SWURCC. "We've had a good service from it," says Alan Grant, head of Bristol University's computer centre, "and we wouldn't want to imply

that we're unhappy with it. But our decision is linked to where we go in the future."

Grant, who is not wishing to comment further, adds that Bristol does not make as much use of SWURCC as it used to. Bristol currently has links with the London University Computer Centre, which has a Cray 1 supercomputer.

However, if Bristol hopes to get a cut out of the grant allocated to the south-west region to compensate it may be disappointed, as the Computer Board is strapped for cash at present.

"If Bristol were to withdraw in 1986, it would want finance to improve local facilities," says Computer Board secretary Edwin Herbert. "The Computer Board would consider it as a local case, but the demands on the capital budget are very tight."

"It costs as much to keep open a regional centre for four users as for five," he adds.

Called an accelerator, it is designed to let users upgrade their systems temporarily to cope with peak loads or provide back-up. The company says that it is unique, and can save users the expense of installing additional CPUs, which may only be needed on rare occasions.

Tony Whalley, Amdahl's services manager, explains that the device works by using software techniques to modify pipeline operations, and achieve optimal processor performance.

It will allow a model 5840 to reach the performance of the next machine up in the range.

The accelerator is activated or turned off by single console commands. It was originally pioneered on the company's 470 series.

Users cannot use the device as a permanent upgrade because of an hourly charge for its use, which makes it prohibitively expensive, says Whalley.

## Amdahl boosts its mainframes

PLUG compatible manufacturer Amdahl has introduced a device which, it claims, boosts the processor performance of its 580 large scale mainframes by up to 35%.

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## Pick gets a European boost

by George Black

THE Pick operating system is to get a European boost as a result of a \$28.8 million deal between French hardware maker Bull and the US Ultimate Corporation.

In the past Ultimate has bought the hardware for its turnkey Pick-based system from Honeywell in the US, which has caused some difficulties with local support. But

now Ultimate has signed its first contract with the Paris group for the supply of minicomputers over the next four years.

The move follows the ending of an exclusive licence from author Dick Pick to French systems house Intertechnique to handle his software. The French company had made little impact on the Continent with Pick. Until now

Ultimate has sold only about half a dozen systems in Europe. But now there are plans to set up European distribution channels, beginning in Scandinavia.

The hardware will be maintained by Bull and the software by Ultimate's UK distributor, Universal Computers (UCL) of London.

UCL managing director, Nick Drescher says it is logical to start the expansion through Scandinavia, where the Microdata Reality machine is already strong.

McDonnell Douglas's subsidiary, Microdata (formerly CMC), runs Pick on its Reality system and had tried to prevent it being spread by its author on to other machines. But the attempt failed and the operating system was later made available on the Honeywell DPS6/Level 6 hardware adopted by Ultimate. Drescher himself is an ex-Microdata employee.

## Prime buys IBM-like plans and sits on them

by Keith Holder

MINI-MARKET Prime has bought IBM compatible hardware designs but claims to have no plans to use them.

The company has made a \$200,000 non-exclusive deal with Cricklen US micro manufacturer Computer Devices for its designs for an IBM-PC lookalike.

A spokesman for Prime says that there are no plans to use the technology for any particular product at present. He adds: "We simply felt it was an excellent opportunity to acquire good technology at a very good price, and we acted on that."

The deal covers mother board and RAM designs and ROM source code. It includes a 5 1/4 inch floppy disc drive adaptor, which Computer Devices recently developed in a bid to make its micros

compatible with off-the-shelf IBM-PC software diskettes.

The company filed for protection under Chapter 11 in the US court, and backing was withdrawn before the product could be brought to market.

According to Computer Devices' president, Robert Moore, the deal with Prime is part of a company plan to license technology used on its machines.

The deal authorises Prime to use or sub-contract the use of the designs.

Although Prime has denied any intention to use the Computer Devices designs to develop its own IBM compatible micro, Steven Selzer, the company's group manager for workstations, says that the company regards the technology as very important, and will pursue it vigorously.

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## Magnuson comes back from the brink

by John Kavanagh

US MANUFACTURER Magnuson Computers has come back from the edge of bankruptcy and is ready to start full trading in the IBM compatible processor market again. And one of its mainstay customers will be the huge US peripherals firm, Storage Technology, which has great ambitions in the packaged systems market following its \$12 million takeover of Global Software last month.

Magnuson was formed in 1977 to make and sell rivals to IBM's 4300 medium-sized mainframes. In 1981 there were takeover talks with Storage Technology and then National Advanced Systems, but they came to nothing.

Last March Magnuson filed for protection from its creditors under US bankruptcy rules. The previous year it made a loss of \$21.6 million on sales of only \$18.4 million.

Magnuson was allowed to continue trading last year while sorting itself out — and Storage Technology became a big customer. In nine months the company's new

Ultimate systems division sold 30 hardware systems based on its own peripherals and Magnuson processors.

Meanwhile Ultimate was also selling distribution industry software on Digital Equipment minicomputers. And its success in the IBM compatible processor market led it into the IBM software business — which brought the takeover of Global Software.

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"We are getting substantial development funds," says George Pilmans, head of Ultimate. "And we're looking for more products. We want to expand all sides of our business into Europe."

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# Software house banks on a first

by Donald Kennett  
US-BASID banking software house Hogan Systems believes it has the first system that can give international bankers a global picture of their operations. But UK-based software firms have dismissed Hogan's claims.

The company acquired the system in December by buying its designer, New York-based Henco Research. It launched it in the UK last week, because it regards London as the world centre of international banking.

Hogan's director of European operations, Rich Warren, says: "We think we're first. Banks have got to know how much they have got and what their exposure is at any given time. And we are the only company that can offer a global picture of their position."

The UK banking software market is currently dominated by Arthur, Hoskyns and BIS. But Hogan believes its rivals' products are getting old and have the disadvantages of being based on smaller machines and of not having integrated foreign exchange, loans and accounting applications.

The three firms listed by Hogan scoff at these claims. "A lot of firms have come to the City road-

ing like a lion and later gone out like a lamb," says John Wills, marketing manager at BIS Software. "We have 280 staff in London alone; Hogan has 20. Our Midas system has been around for some time, but it's constantly updated. We've announced three new modules in the last six months."

The UK-based firms use Digital Equipment computers and the IBM System 34, 36 and 38. They say they use this size of equipment because that is where demand is.

Hogan's IBMS runs on IBM mainframes from the 4300 upwards, under MVS and DOS/VSE, using the CICS teleprocessing monitor and IMS, DL/I or IDMS database management systems. It is designed to accept input online from bank branches and to provide online analysis of level of activity, exposure and profitability by customer, branch and product.

Its advantages are claimed to include control in a changing business environment and increased productivity by eliminating the need for manual consolidation of separately produced figures.

Warren says: "Institutions can't bring their own resources to bear on producing this kind of system

for themselves - they've got to buy it in. There seems to be a thirst for this kind of product in Europe."

Hogan Systems was formed in 1977 and set up its UK subsidiary last April. It was looking for a UK distributor when Warren persuaded its management to set up a subsidiary instead.

Warren was European sales and marketing manager for Cincom and he contacted Hogan while looking for systems that Cincom's Total database management system could be interfaced to.

Warren says: "Software companies basically sell a bag of wind for a lot of money, so the quality of their people is vital. We try to hire the best we can, and our staff turnover is low."

The company's revenue per employee climbed from \$90,000 in 1981 to \$146,600 last year, while the industry average remained constant at \$80,000, according to Warren.

Revenue for the nine months to December 31 were \$20 million, with net profits of \$2.4 million, compared with the equivalent period a year ago when revenues were \$12 million and profits \$2.6 million.



WARREN... "We think we're first."

## Olivetti wins part of £3m deal with South Africa

by Donald Kennett  
OLIVETTI and UK software house Systems Designers have won a £3 million contract for the South African public viewdata system.

The other contenders on the shortlist were GEC, Sperry and a consortium from France. IBM was invited to tender but withdrew its bid, advising the Post Office to wait another year before going ahead. IBM has suffered major delays to its implementation of the West German Bundespost's Bildschirmtext system.

The contract covers software enhancements to the trial system until the full system comes into service in the summer of next year. The full service will run on a network of seven DEC Vax superminis in Pretoria, Johannesburg, Capetown and Durban.

It will have a main database with a million pages for information services and a further 200,000 pages for message services. Subsidiary nodes will have cache databases to hold information frequently accessed from the main database.

A spokesman for SDL says that the service will differ from British Telecom's Prestel by placing more emphasis on gateways to external computers and by making use of CEPT (Conference of European Postal and Telecommunications Administrations) display standards. This follows the example set by Bildschirmtext.

## Wordplex picks PC compatibles

by Keith Holder  
WORD processor manufacturer Wordplex has turned to US micro maker Corona Data Systems for a range of IBM PC compatible machines for office automation.

A multi-million dollar OEM deal has been agreed for machines already seen under Corona's own label. Alan Adler, OEM sales manager for Corona, says that this is one of several such deals in progress.

Corona, says Adler, is looking to supply its machines to companies which have developed a strong presence in more specialised markets. "Wordplex is a quality company in office automation; we are very pleased to be doing business with them." This is the first time Wordplex will market a machine

not built at its own factories.

Wordplex is the second-largest supplier of word processors in the UK, with over 5,700 units installed. UK turnover was £19.4 million last year, an increase of 30% on 1983, and the company is hoping to push this to £25 million this year. The UK accounts for around 35% of sales.

Three machines are offered by Wordplex. The first is a standard PC model, with 128 Kbytes of RAM, expandable to 512 Kbytes, based on the Intel 8088 processor. It features full IBM PC compatibility, high resolution 12in screen and two 320K floppy disc drives.

Next comes the XT model, which internally is identical with the PC, but has a 10 Mbyte Winchester disc drive.

Lastly, there is a portable version. With a weight of over 20lb, however, its maker admits that this puts the machine more into the transportable class. It carries the same specification as the PC, but the screen is shrink to fit.

All the machines run MS-DOS and use Corona's version of Basic. A PC tutor package to help users familiarise themselves with the product is included in the price.

Optional extras include colour boards, Epson printers, word and mouse. Software packages offered include the Multiplan worksheet, Lotus 1-2-3 and the Friday electronic filing system.

Roger Winder, Wordplex's director of marketing, strongly denies that the introduction of these machines will damage sales of the

company's word processor range. "What most people don't realise," he says, "is that word processing packages designed to run on micros are only suitable for occasional use, and won't cope with the workload that, say, an office secretary would require."

He adds that the introduction of the micros is only the next step in the company's bid to become a supplier of complete systems for office automation.

The system approach will become more apparent when the company launches its System 8000 file/resources network connector next month which allows micros, word-processors and peripherals to be used either as a distributed system or connected to the Rascal Planet network.

## Micro diploma is in offing

by Philip Hunter  
UK SCHOOLS and technical colleges could next year be offering nationally recognised diploma courses on practical microcomputer applications. The Royal Society of Arts, one of the leading national examining boards, is looking closely at a diploma course being taught this year at five schools and an adult technical college in Milton Keynes.

"They want to take it off us and validate it nationally," says a spokesman for the Milton Keynes Industry-Education Liaison Committee, which produced the idea for the course.

The course is a joint initiative



FLUCK... "Teach concept."

between schools and local industry in Milton Keynes, to provide instruction in microcomputer operation and use of business software, such as financial spreadsheets.

"Our aim is to teach the concept rather than specific skills," says Andrew Fluck, head of computing at Stantonbury Campus, a local school involved in the course. "The idea is not to give specific instruction in programming, but to teach general details of how to handle a silicon office."

The course includes 40 hours of direct teaching, and 40 hours' unsupervised use of micros, spread over a school year. There are eight sections, including viewdata, ac-

counts software packages, commercial applications, and there is a visit to see how local businesses use micros. The course ends with a practical business project, such as using a word processor to prepare a report.

Fluck says there are plans to extend the course to cover more advanced applications, such as integrated business packages.

At the same time the present course may become part of the foundation training for science students at universities. Schools in Croydon are also offering a diploma course aimed more at 12-13 year olds.

computer and accepts incoming data from the network. Foreground tasks, such as word processing, can continue during the time the terminal is connected to the host.

There are eight subscribers so far, including Ford, Memorex and Perkin-Elmer, and Marcus says he expects to sign up four more by April. According to Marcus, the Wine service is cheaper than phone or telex.

"Wine costs 50% less than telex going from the US to the UK and 10-15% from the UK to the US," he says.

## SALES BRIEF BT's buys from Ferranti reach £12m

BRITISH Telecom has now spent over £12 million on Ferranti terminals since its split from the Post Office in October 1981. The latest £500,000 order for 300 P77 programmable terminals brings BT's stock of Ferranti VDUs to over 6,000, as well as 700 P77 cluster controllers.

The P77 can be linked to BT's existing ICL and IBM mainframes, providing dual emulation from one terminal.

## Refuse collection

LAMSAC's refuse collection system, Ross, has now found its way into Australia. After winning several orders in the US, Lamsac, the Local Authorities Management Services and Computer Committee, has signed a contract with the Local Government and Shires Associations of New South Wales, which will market the Ross product, designed to improve efficiency of rubbish collection.

## NCC gains rights

ICL HAS granted the National Computing Centre exclusive rights to market its audio-visual training package for the VME operating system. This means that UK ICL users will be able to rent the package under the NCC's rental scheme, and overseas customers will have access to it from the NCC International Division.

## Ireland contract

HONEYWELL has taken the £2.5 million contract for the second phase of Ireland's local government computerisation. The contract was awarded despite the fact that Honeywell has no manufacturing base in Ireland, although some rival companies do.

## Champs in China

THE Champs hotel management systems, marketed by Thomson's Software Sciences, has been installed in two hotels in China, including the 2,150-room Lido Hotel at Peking airport. Champs handles hotel administration, including restaurant point of sale, guest billing, bookings and telephone monitoring.

## Far East deal

SHORTLANDS Computing Services of London has signed a £500,000 export contract with CSA, a software house based in Singapore, to market and distribute business software in the Far East. Involved are multi-currency packages for Unix-based micros, embracing general ledger, purchase ledger, cash book and cost ledger.

## Gould's first

GOULD SEL has taken its first order for its new mid-range 32/67 super-mini, from Birmingham University's electronic and electrical engineering department. The machine, for use in post-graduate research and undergraduate teaching, will be implemented with the unit operating system. A typical 32/67 configuration costs about £100,000.

## Dairy automation

APV INTERNATIONAL, Sussex-based maker of automated manufacturing equipment, has taken a £1 million order to automate a dairy in Reykjavik, capital of Iceland. APV International is part of the APV Group, based in Crawley in Sussex, which turned over £400 million last year.

## Electricity control

THE Midlands Electricity Board on Tuesday switched on a £2.3 million telecontrol system supplied by Ferranti. The system will provide remote control of substations and automatic reduction of voltage according to predefined rota or surge in demand.

# NCR prepares to attack the office

by Paul Walton  
NCR is set to launch a new mid-range machine to take on the computer industry giants in the office automation market.

The company is buying in systems software and some hardware to add to its own efforts to sell what it calls "departmental systems architecture" - integrated systems based on a common bus with Ethernet connections.

The company's new range of machines, the V-series, is to replace its current 8500/8600 mainframes and is aimed to compete directly with the IBM 4331/4341. It is to be launched in May and scheduled for installation by the end of the year.

Nicknamed "Instant Ready", the range uses NCR's proprietary 32-bit chip set which was first used in the 9300 super mini and a distributed version of the company's VRX (Virtual Resource Executive) operating system for the first time.

It will offer continuous service of the Tandem Non-Stop style through a capability of linking the hardware components and using redundant processing capacity on the 32-bit chips. Users will have the option of buying a conventional processor first and adding the continuous processing as an optional extra.

Henry Thornhill, NCR UK's man in charge of the V series, says that it will "move away from being tightly-coupled, or having the operating system in one central processor, to be a loosely-coupled multi-processor".

Instant Ready's are departmental machines because they sit on a common bus, or network, onto which all other NCR products are linked through the SCSI (or Small Computer Systems Interface).

The VRX operating regime will begin to overlap and interwork with the IRX (or Interactive RX) mini systems. Around the office,

NCR will support links via Ethernet.

The heart of NCR's range will be predominantly based on the Unix System V operating system: both the 9300 Vax-like and the Tower office processor will interwork through Unix.

The NCR Decision Mate V micro, currently an 8/16-bit (CP/M-86 and MS-DOS) double, will soon get true 32-bit working and Unix making it a treble operating system workstation, according to NCR.

In the UK, the company has set up a product marketing group to smooth over systems integration and marketing. Graham Miller, director of the group, says that NCR "is now committed to becoming the supplier of office automation by the mid-1980s", and adds that this would be achieved by swinging the focus away from individual products and "concentrating on the complete system



MILLER... "Committed to becoming the supplier of office automation by the mid-1980s."

based at departmental level".

Both the DMV micro and 9300 mini will be improved in 1984.

An American product, NCR's WorkSaver word processing workstation, will also herald the start of a new line of office systems based on the Convergent Technologies machines.

Larger items of systems software, especially productivity tools and standard applications, will be brought in. "The first such package is Informatics Corp's well-known system generator TAPS (or Terminal Application Programming System), due for release with the Instant Ready mainframes.

## What do you think about structuring?

by George Black  
THE controversy over use of structured methods within data processing departments has prompted *Computer Weekly* to commission a survey on their use.

Last November, a scheme put forward by the National Computing Centre (NCC) to bring structured methods into its systems analysis courses, met with considerable criticism. The examinations board of The British Computer Society, which is under NCC supervision, says the new approach must be followed from December of this year.

The board, however, has been accused of forcing the pace, and of running the risk of deterring students from entering examinations.

Some 13,000 people have passed the examinations since the late sixties, and basic systems certificates continue to be awarded at the rate of about 1,000 per year.

Datasolve Education, whose general manager, Don Yates, is chairman of the BCS Systems Analysis Examination Board, has agreed to do most of the research on the proposed survey.

*Computer Weekly* readers are asked to complete the form below and return it to CW Structured Survey, Room 1218, Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS. A representative selection of installations which respond to the survey will be asked if they can be visited so as to obtain more qualitative information. A report on the survey's conclusions will be printed in *Computer Weekly*.

Name .....

Address .....

Tel. No. ....

1. Do you use structured methods for analysis and design? Yes ☐ No ☐

2. If yes, which methodology? .....

Do you use structured programming techniques, and if so, which? .....

Why did you change to structured methods? .....

What benefits did you expect to get? .....

Have the expected benefits materialised? .....

What specific structured systems tool do you use? (eg dataflow diagrams, structured walkthroughs, data dictionary, structured English, decision tables, data structure diagrams, others.) .....

3. If no, did you decide not to change because of specific problems, and if so, which problems? .....

Do you plan to take steps towards structured methods? .....

Within the next six months? ☐ 6-12 months? ☐ 12-24 months? ☐

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## BT policy has put UK ahead, says Butcher

by Nuala Moran  
INDUSTRY Minister John Butcher claimed last week that the UK had stolen a march on other European PTTs because of the government's policy of liberalising British Telecom.

This would lead to London becoming the value added network services (Vans) centre for Western Europe, he said. So far 72 companies have been licensed in the UK for over 200 Vans.

"We have created the most liberal Vans regime in the world and privatisation later this year

will stimulate competition and innovation which will be the key to the growth of Vans experience," said Butcher. He added that this would lead to "London having the same presence in telecoms services as it does in financial services."

Butcher was speaking at the opening of Mohawk Data Sciences' (MDS) electronic mail centre in London. Called Winc (the Worldwide Integrated Communications Centre), it is tied into an international network.

The centre in London which

uses DEC hardware is linked to another Winc centre in Connecticut. Winc has been available in the US for seven years and Richard Harcus, marketing manager for Winc, says that pressure from US subscribers wanting to link to European subsidiaries is one of the factors that influenced MDS setting Winc up here.

Winc is based on a central computer dialling subscribers at predetermined intervals 24 hours per day. An MDS Series 21 computer installed at the subscriber's office sends messages to the central com-

puter and accepts incoming data from the network. Foreground tasks, such as word processing, can continue during the time the terminal is connected to the host.

There are eight subscribers so far, including Ford, Memorex and Perkin-Elmer, and Harcus says he expects to sign up four more by April. According to Harcus, the Wine service is cheaper than phone or telex.

"Winc costs 50% less than telex going from the US to the UK and 10-15% from the UK to the US," he says.

Jep in 1/1/84





FREESE... "Expected 2,500 registrations turned into 30,000."

## MPs slam Data Bill again

by George Black

THE Data Protection Bill returned to the Commons last Monday and passed its second reading amidst a mounting wave of criticism of its potential effectiveness.

Critics of all political colours have told the government that its plans will not work, despite the amendments made by the Lords.

The main point that they make is that the number of registrations will be too large for the resources of the registrar to handle.

Home Secretary Leon Brittan made an effort to conciliate the Bill's critics by telling the House: "There may well be further improvements still to come." But this had little effect on those who believe that the scope of the Bill is too wide.

At a recent briefing of a British parliamentary committee, the Swedish data protection commissioner, Jan Yrkes, said they had expected 2,500 registrations and now had 30,000 to be handled by

30 staff. The UK registrar is expected to appoint 20 staff. But in 1982, the Home Office listed 180,000 British businesses with a turnover of at least £250,000.

This week, Ted Cluff, secretary general of the Institute of Data Processing Managers, said that many other smaller businesses would also be involved because amendments to exempt common files such as accounting would allow very few firms to escape registration.

One MP estimated that Britain would need seven commissioners and 300 staff to be able to cope. Cluff commented: "The Bill won't work. It'll be a terrible waste of our members' time and money but it will probably be enough for the government to be able to ratify the Council of Europe convention."

The National Council for Civil Liberties (NCCCL) doubts whether it would even achieve that aim.

General secretary Larry Gostin says: "The British Bill is the wea-

kiest in Europe and may well not comply, because of the Home Secretary's sweeping powers and the exemptions for police and national security. These do not exist in any of the other European countries which have laws on the subject."

The Consumers' Association has come out in support of the NCCCL's campaign for clerical records to be covered by the legislation. It recently carried out a survey on privacy.

"People want and expect personal information to be kept confidential, but they trust few organisations to do this," says director Peter Goldman. "Even those they trust most - doctors and hospitals - do under certain circumstances disclose private information."

Finance and credit card companies are particularly distrustful on confidentiality, according to the survey. Nearly half those questioned did not believe their employers always kept information confidential.

Official sources said that Tebbit intended to give more backing to

## Tebbit's DoTI plan aims to win exports

by George Black

SECRETARY OF State Norman Tebbit has shaken up the Department of Trade and Industry to make it push exports and to strengthen the telecomms and information technology divisions.

In so doing, he may have made it impossible for a future Labour government to split trade from industry as the Wilson government did in the mid-70s on taking over from the Heath government.

His merger of trade and industry was begun by Cecil Parkinson shortly after the general election last summer and has now been completed by his successor.

In an introduction to a new leaflet explaining the changes, called *Aims*, Tebbit writes: "The distinctions between service and manufacturing industries in home and export markets matter little to the creators of wealth, and the new organisation ensures that industrial and commercial policies are designed in harmony from their inception, rather than co-ordinated after leaving their separate stables."

Industry divisions such as telecomms and information technology will gain control over their own export and regulatory affairs, which were formerly handled by the trade side.

Official sources said that Tebbit intended to give more backing to

efforts to diffuse new technology both into British manufacturing and engineering industry and into the government itself.

Observers on the Labour side, however, view the announcement as more of a muscle-flexing gesture by Tebbit in warming up for a struggle with Chancellor Nigel Lawson.

They point to Tebbit's assertions that his is "the other main economic department beside the Treasury" and "the only department beside the Treasury to have two permanent secretaries".

Tebbit's keenness to underpin worthwhile computer ventures is bound to come under critical scrutiny from Treasury officials trying to keep expenditure down and achieve tax cuts.

But at the same time, official sources emphasise that the re-organisation is one of method, not of policy. Tebbit sticks closely to the approach of his predecessor, Cecil Parkinson, in his commitment to fighting protectionism.

Labour's campaign document for the last general election pledged the party to set up a new Department for Economic and Industrial Planning, to end the conflict between the DoTI and the Treasury. But last week, a party spokesman could not say if this was likely to be the policy when the next election came round.

## NEC plans second UK factory

A DECISION is pending in Tokyo on plans which the Nippon Electric Company (NEC) has to set up a second factory in the UK. The factory will make telecommunications equipment. NEC already has a chip factory in Livingston, Scotland, which started production in October 1982. At the moment, 200 people work there and this number is planned to go up by 600 by the end of 1985.

## Davidson moves

BURROUGHS' general marketing manager, Iain Davidson, has left the company to take over as Data General's UK sales manager. Davidson replaces John Filmer, who was recently appointed to head Data General's Australian operation.

## PPL personnel

UK APPLICATIONS software supplier Package Programs Limited (PPL), which had a turnover of £5 million last year, has entered the computer personnel recruitment field. Chairman Roy Taylor says that the new division will cover the whole industry and expects it to account for about 2-3% of his turnover next year.

## Windsor start-up

US LOCAL network company Ungermann-Bass has set up its own UK operation. The Windsor-based subsidiary is headed by Ron Davis, formerly network product manager at Ungermann-Bass's UK distributor Thame Systems. Davis says that the growth of UK business means direct support is needed.

## March for books

MARCH will be Computer Book month, and 150 nationwide book-sellers will stage window displays of computer books and software. John Wiley and Sons will sponsor the event, and will exhibit its own publications as well as others it distributes, including books from the National Computing Centre, Sigma Technical Press, and software from Acornsoft.

## Times 10

LAST week's Micro News story about Apple and its Macintosh said that the planned production for the new micro would be 4,000 units per month by the end of this year. That should have been 40,000 Macintoshes a month - a rate of around half a million per year.

## Keele researches

THREE ICL Perq workstations running on the Unix United operating system will go to Keele University's Computer Science department for a three-year £195,000 government-funded project to try to boost the reliability and functionality of data management in distributed computer systems.

## Net earnings up

MOTOROLA has reported net earnings up 37% in 1983, at \$244 million, on sales up 27% at \$1.27 billion. Earnings rose from \$63 million to \$95 million in the fourth quarter.

## Profits up 80%

NORTHERN Telecom, now North America's second largest telecommunications manufacturer, has reported operating profits up 80% at C\$227 million on revenues up 10% at C\$3.3 billion. Fourth quarter net was up 50% at C\$67.0 million on revenues ahead 25% at C\$974 million. The company, which is controlled by Bell Canada Enterprises, saw its 1983 Canadian revenues dip 14% but it is making inroads into the US markets.

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SCHRYVER... "Choice of processor is irrelevant."

## Lynwood aims to trap IBM users

by Philip Hunter

IBM users in the UK now have an independent British source for intelligent terminals.

Lynwood, which claims to be the leading privately-owned UK maker of intelligent terminals, last week launched Traps, a transaction processing package which enables its Alpha terminals to take over forms handling and validation tasks from the host mainframe.

The company has also launched an IBM 3274 emulation package for its Alpha terminal range, offering the standard IBM features plus high resolution graphics.

Lynwood makes two terminals, the eight-bit Beta, based on the

Z80A, with 8K memory and costing around £1,000, and the 16-bit Z8000-based Alpha with 192K internal memory for between £1,400 and £2,000.

The colour version of the Alpha costs £1,000 more. Technical director Andrew Schryver says that the actual choice of processor for the terminal is arbitrary. "The choice of processor is irrelevant, as IBM has shown," he says.

Managing director Hector Brown claims that Lynwood was one of the first companies in the world to use a 16-bit processor in a terminal in 1975. Last year, the company turned over £5.3 million, and Brown says it is heading for

£9.5 million for year ending June 30, 1984.

The company manufacturers at Alton in Hampshire, and has offices in London and Harrogate, plus subsidiaries in Holland and Switzerland.

Total staff is 200, but Brown says this should increase in 1984 with new offices planned in the Midlands and Scotland.

In the UK, the company handles its own marketing and support, but sells through distributors abroad.

The company recently bought Dyadic, a small UK specialist in software written in the APL language.

## Benefits cuts will hit ICL package

by John Kavanagh

ICL's troubled local authority package which handles social security benefits has hit new problems because of government plans to cut benefits by £230 million.

ICL and the 40 users of its housing benefits system say they cannot make the changes in time for the start of the new financial year on April 1.

But other suppliers and their users are confident that the deadline can be met, even though social security minister Dr Rhodes Boyson has not yet announced all the details of the changes.

The housing benefits rules took effect last April. By the summer, local authorities - traditionally ICL's staunchest allies - were saying its failure to deliver a working system had cost them extra work and long delays in getting out rates and rents demands and rebates.

This week, Guildford city data processing manager Tim Russell said: "We're very concerned about the proposed changes. After our experience of the last year it doesn't look as if ICL will do it in time."

"We're considering moving to a hybrid system which would be mainly manual - and the computer part wouldn't be ICL. We are talking to other suppliers."

Brian Thompson, treasurer at Wychavon District, says ICL had not provided programs to run year-end routines yet. "They can't be working on those routines and on the changes," he says.

Thompson adds: "We will have to carry on providing benefits under the old rules and then recover the payments later. This could mean asking money back from pensioners."

But Thompson also blames civil servants. "I don't think people in

Whitehall appreciate the impact of what they're doing," he says. "These changes will be introduced at the year end, our busiest time."

But other companies' users are more optimistic. At Babergh District, which uses a system from F International, assistant treasurer Mike Cheese says there will be "no problem".

"It's a nuisance, but it will be done on time because most of the changes are as we expect, there should be no problem."

NCR local authority manager Phil Gieghorn says: "If the changes are as we expect, there should be no problem."

Geoff Rees, managing director of Business Micro Systems, says: "There's no question, it's a problem. If they settled on the details today we could just about produce a code which would be tested by use but not by users."

## MSC starts adult IT scheme

by Nuala Moran

A SCHEME to provide adults with information technology training is being launched by the Manpower Services Commission at nine of its regional Skillcentres. The first of these courses will take place either at Plymouth, Birmingham or Letchworth later this month.

An MSC spokesman says: "The idea is to set up something rather like an ITRC for adults. The training will definitely be practical, including computer technology, CAD/CAM and so on."

ITECs (Information Technology Education Centres) are designed to give practical experience to school leavers with 'O' and 'A' levels.

The kind of skills taught are usually related to local industries. The idea is to create a commercial environment, and ITECs are registered companies.

At the same time, plans to revamp the 87 Skillcentres in the

country so that they can "meet the challenges of the new technical age", are being looked at by the government. The plans have already been approved by the MSC itself.

Reorganisation began last year when the 87 Skillcentres were placed under the Skillcentre Training Agency.

The Agency was told to make the centres self-supporting by going out into the market and selling their services on a trading account basis. According to the MSC's plans, this should mean full cost recovery from 1986/87 onwards.

Most of the Skillcentre's business is in the Training Opportunities Programme (Tops). Last year, plans were announced to change the computer training offered by Tops following complaints by the industry that the courses were not producing people it could use.









## SOFTWARE FILE

## Logica puts Rapport on the Perq

LOGICA'S Rapport relational database is to be marketed on ICL's Perq workstation through the ICL Tradepoint distribution scheme. It will be run under the PNX Unix-based operating system with the windowing facilities. Rapport is also to be delivered to the US firm Perq Systems Corporation (formerly Three Rivers) in which ICL holds shares.

## Bureau launch

BUREAU ADP Network Services has launched a project management system called APECS/8000 to run on a range of machines from micro to mainframe and under the Unix operating system. The system uses critical path techniques to help managers plan and control project schedules, resources and costs.

## Into business

THE BBC Micro is edging into the business world with the addition of an API package from Inner Product of London. It is to be called Acornsoft API and will be available in two months under the CP/M business system.

## PC collaboration

ASTON Technology of Birmingham and Interactive Data Machines of Doncaster are to collaborate to make the application generator System Builder available on the IBM-PC under the Pick operating system. Aston has the rights to the generator, while IDM has the rights to Pick on the PC.

## Unix conversion

ORACLE Corporation of California has converted its relational database to run under Unix System V. Oracle is to sell the product itself in the UK and Ireland after ending its two-year distribution agreement with software house CACI. President Larry Ellison claims the product to be 98% operating system-independent.

## Productivity tool

TANGENT Computer Services of Essex is to sell the Canadian software productivity tool for IBM mainframes called tableBASE. An agreement has been announced between Tangent and Data Kinetics for the tool.

Software File is compiled by George Black

## Overload solution arrives in the UK

A NEW solution to the problem of mainframe overload is about to come on the market in this country.

It is a hybrid - both nationally and technically. Devised in California by the partnership of American David Britton and expatriate Englishman Geoff Lee, it is to be imported by Thorn-EMI's subsidiary Software Sciences.

The trick they claim to have figured out is how to relieve the large machine with a back-end processor running a relational database.

According to Britton, mainframes which evolved on the standard Von Neumann architecture were never well-suited to commercial data processing, having been created for scientific work. The result was that in putting sophisticated database software on to them, the system would seize up with as few as four users.

The problem is common, he

claims, when running IBM's SQL package on a 4300 and will not be much alleviated when it offers DB-2 running under MVS on a more powerful machine.

Similar troubles occur with most other makes of hardware.

In 1979 he and Lee, who were systems builders for BASF, tried to interest BASF in backing the idea of a hardware-independent database machine. But they say BASF did not know what they meant. So they raised £11.5 million capital for their own firm to do the development - most of it from the UK, including a contribution from the British Technology Group.

They appointed as project leader Robert Epstein of Berkeley University, with which they still have close ties. They admit that the scheme turned out more difficult than anticipated; it has been very delayed in coming to market. But they now claim over 100 US users.

They have signed a deal for Software Sciences to distribute and support the product in the UK. It will be able to take up to 64 host machines.

Prices will start at about £50,000. Britton claims that an IBM-PC and his purpose-built add-on will have more power than a 4300 running a package.

Timing will be of the essence. Field leader was Intel, with a machine which may have been pitched at too low a level to gain much success. It was the same snag that held up Britton-Lee.

"We don't want to leave too much to the user, so we have to get it right before the launch," he says.

IBM itself meanwhile will probably follow with such a device. Software Sciences marketing director Fred Eldridge said such systems would have important implications when the new data protection law forced users to store their data more securely.



ELDRIDGE... Important implications under privacy law.

## Alvey reliance on Unix is questioned

DOUBTS about the Alvey Programme's commitment to Unix were raised at a seminar attended by representatives of 100 British firms last week.

The directors of the national fifth generation plan were warned it would be unwise to rely on enhancing an American product while speculation was mounting about a possible technical embargo.

Several delegates said that

though there was no alternative to backing Unix at present, the directors should broaden the scope of the programme to give the UK greater independence in the future.

After the private meeting, Alvey software director David Talbot's only comment was: "Well, at least I didn't get any bricks thrown at me."

Mark Dowson, of Imperial Software Technology, one of the critics

at the meeting, said later: "We should think seriously about Unix as a short-term measure. I do not suggest we should develop an alternative, but I think the operating system may become a less important feature. Databases and formal specifications are the areas we should look at."

"If we rely wholly on Unix we may find we cannot get hold of parts of the system which are restricted to the US, such as the security features."

Evidence for the rapid spread of interest in Unix was available at the first exhibition staged by the UK User Group in London.

NCR began a campaign to bring Unix to the medium-to-small business through its Wales and West distributor Bridge Computers. Bridge signed a £400,000 deal for 20 NCR Tower machines, NCR's 68000 based micro, and a mix of Unix applications from Sphinx.

Meanwhile the government procurement agency, the CCTA, is conducting an evaluation exercise of a number of Unix-based systems.

These include both Uniplex and Xenix, the versions offered by Unisoft and Microsoft respectively, and both are available on the Plessey micro which the CCTA is testing.

A decision is expected in the spring.

## New Ada ideas are flooding in

Michael Pickett, senior Ada consultant of the CAG group, continues the series he began last October on Ada development.

A PROGRAMMER really has quite an easy job. There are only two things to be done: get the system working and keep it working. Unfortunately, that can turn into a lifetime's work if insufficient attention is paid to any particular aspect of the lifetime of the system.

It is usual to consider a computer-based system as having a life cycle rather than a lifetime, in that often it replaces an earlier (perhaps non-computer based) system, and it is expected that one day it will be replaced in its turn by something better.

During that life cycle the system evolves from something that can best be described as a need or a want (not the same thing) to an artefact which, to a greater or lesser extent, reflects that initial concept. On the way many phases can be identified, but there is as yet no standard classification for these phases.

A typical life cycle model might encompass the identification of the need, an initial statement of requirements, an analysis of the requirements resulting in a specification, conversion of the specification into a design for the system, followed by a specific implementation of that design.

The life cycle does not end there, though. Often along the way compromises are made; facets of what is to be done are misconstrued; sometimes even mistakes are made. More fundamentally, time has passed and the need is different. Materialisation and practical application serve to demonstrate both weaknesses and limitations in the concept. Imagination and creativity are given a new lease from which to work. And so the system evolves yet further.

The development of Ada to date is an interesting example of this

life cycle process. By the early 1970s, the US Department of Defence found that its expenditure on software for computers embedded in military equipment was in the region of \$3.5 thousand million a year, largely due to it was thought at the time, to a morass of totally inadequate programming languages which rapidly sucked in the money and showed very little return.

Although deeper investigation revealed that it was the approach to the whole life cycle of the systems that needed review, the

single life cycle model and stick to it at all costs. Real life cycles are not like that. Sometimes extra phases have to be introduced; sometimes phases have to be iterated, as in Ada with Strawman and Woodman. Ada also had a special phase after Timman, a choice between two ways forward: whether to select and standardise on an existing language, or to develop an entirely new language.

In the event, no existing language met the functional requirements as specified in Timman, so a specification for the design of a

puters in the early phases. It has nevertheless been successful, no doubt due to the painstaking care of each of the project managers who shared in its progress. It has undoubtedly been an expensive project.

Ada, the language, also does not address the early phases of a system life cycle, and it is Ada in conjunction with an accompanying tool set, an APSE, that is now seen as what is really required for full life cycle support.

The Ada project has received much publicity throughout its development. It has entirely overshadowed the two other initiatives which are equally if not more important for the efficient and cost-effective development of large systems.

The first of these is the identification and construction of the environment to support a project during its complete life cycle. This project was initiated by the US Department of Defence in a similar way to the Ada project and gave rise to documents Sandman, Pebbleman and Stoneman.

Unfortunately, although these documents present ideas for further work, no real directed development has taken place, and support environments under construction lack the coherence that has been evident from the Ada project.

Nevertheless the foundation is there and presents a challenge for would-be developers.

The other essential ingredient for successful life cycle support is method.

In conjunction with the Ada project but begun only recently by the Department of Defence is the project known as Methodman, but this has received little attention outside a small circle of specialists.

However, a well researched methodical approach using the right support tools throughout the life cycle is the means to making the most effective use of Ada.

Ada's life cycle is now at the implementation phase. To be more accurate, versions of the implementation phase are proceeding more or less in parallel. Some, a very few, have been completed. Already the compromises and mistakes are being noted and new ideas are flooding in

Immediate problem was seen as stabilisation of the programming language. The need had been felt.

In 1975, the High Order Language Working Group started taking soundings to establish what the essential ingredients of a good programming language. Many ideas were presented, often in conflict with one another, and these were sifted and filtered, then published as the document known as Strawman, the initial statement of requirements.

Publication of this initial statement of requirements provided the basis for the next stage, the analysis of requirements. The analysis was such that the requirements were refined and republished as Woodman, to be followed by further analysis and eventually the publication of a functional specification, Timman.

It would be wrong to define a

new language meeting these requirements was evolved and published as Ironman.

The design phase of the Ada life cycle was undertaken initially by four contractors, but again the phase was iterated, Ironman giving way to Steelman and only two of the contractors continuing with their designs. Eventually just one of the designs was retained and, after considerable refinement, became the Ada language we have today.

Ada's life cycle is now at the implementation phase. To be more accurate, versions of the implementation phase are proceeding more or less in parallel. Some, a very few, have been completed. Already the compromises and mistakes are being noted and new ideas are flooding in.

For a project so intimately associated with computers, the Ada life cycle itself made little use of com-

## MICRO NEWS



JACKSON... "Now running at \$100 million a year."

## Altos shifts into OEM business

Robert Parry, micro maker Altos is refining its act. It has effectively dropped the Motorola 68000 products from its line of multi-user business micros, to concentrate on machines using the Intel 8086 processor family allied to the Unix operating system.

And it is starting to move hard into the OEM market, relying on big ironclads here to boost turnover to the half-billion dollar mark.

"We are running at \$100 million a year right now," says president Dave Jackson, who reckons to hit \$140 million next financial year and nearly double that the year after.

"The jump will come through getting into the OEM market," he says. "We already have deals with CDC and ADP, and have been attacking large DEC system houses. But I am looking to get about 30% of business through the OEM market, which means bringing in new ones."

And bringing in new OEMs means taking them from Convergent Technologies.

By the end of the year new machines using Intel's 286 16-bit will be coming from Altos, and will now be aimed squarely at the

market presently served by Convergent. Altos will still be working on a high-end OEM machine using Motorola's 32-bit 68020 - just in case it is what the customers want, says Jackson.

"We still sell our 68000 box, but the future looks better with the Intel devices. All the majors have gone with them - especially IBM."

He adds that the 68000 machine is a "goldmine" now, as it sells itself, with no advertising or developing spending.

On the way to Altos' recovery from last year's slack time, caused by falling sales on early products before the new 8086 line really got going, says Jackson, there will be hefty management changes. A clutch of new board members are being recruited, the most recent being LSI Logic's Wilf Corrigan, like Jackson an expatriate Briton made good in California.

Jackson himself is to step aside from direct control of the company. A new president - a good marketer from the computer industry says Jackson - will take over the running of the company.

"We will start acting like a billion dollar company, start taking the risks needed," he adds.

## Prism flies up-market with Wren

by John Riley

SINCLAIR microcomputer distributor Prism Technology Holdings is moving up the low end business micro market with the launch of its own Wren eight-bit portable micro.

Designed in the UK by Transcom Components and built by Thorn-EMI, the Wren offers a built-in modem to link with videodata systems. It is built around a Z80 processor, has 64 Kbytes RAM expandable to 256 Kbytes, a 7in screen and weighs in at 20lb. With four software packages it will cost £1,000.

Prism has also extended its position in the home computer market by seeking the sole UK distributorship for US company Andros' "personal robots". The smaller of these, which sells



DENTON... "Larger" claims.

for £200, can be controlled by BBC, Commodore 64 and Spectrum micros using software implemented and sold by Prism.

The foundation of Prism's expansion has been its distributorship of Sinclair micros. "We are the largest distributor in the UK and sold one-third of a million units in 16 months," says Prism managing director, Bob Denton.

## Forecasters see a semi boom

by Keith Holder

BUSINESS is booming for semiconductor manufacturers, and the industry is set for a bumper year. This is the conclusion of three market research organisations.

Mackintosh Yearbooks, which looks at the European market, estimates an increase in demand of 5.9%, taking the value of orders to \$82 billion.

The strength of the recovery in the semiconductor industry has surprised even the manufacturers, and has found the major corporations short of capacity.

Don Beadle, National Semiconductor vice-president for marketing and sales in Europe, admits that his company "has demand above our ability to ship, especially in logic and linear circuitry".

Europe is trailing last year's US recovery, but the battle for market share is heating up as demand continues to grow.

This has prompted NatSemi to allocate \$200 million for increasing production capacity and research and development, of which some \$50 million will be spent on the company's UK facilities.

But the Japanese stand to gain most in terms of European market share, according to US market research company Dataquest. It estimates that Japanese manufacturers will reach revenues of \$340 million, a rise of 57% over 1982, giving them 10% of the market.

Toshiba UK marketing manager for semiconductors, Phil Pittman, says the company has already had a good year in 1983 - he hopes to double its market share to 3% by 1986.

He confirms that, like NatSemi, Toshiba was running flat out at the moment and plans are at an advanced stage to increase production capacity.

Dataquest says that sales of MOS devices, particularly memory chips, is a major reason

for the advance of companies like Toshiba, Fujitsu and Hitachi in Europe.

Their gains have been almost entirely at the expense of the US companies. European manufacturers have remained relatively stable as a group.

Intel, Motorola and NatSemi all say they expect to increase market share, through new releases and increased demand for popular chips, provided they can make them fast enough.

But Intel has already run into trouble under-estimating the demand for its 80186 and 80188 16-bit processor chips. Despite plans to triple production of the two chips, shortages are expected this year. These may be partially resolved by signing up a second source, like the company's technical partner, Advanced Micro Devices.

One thing the majors all seem confident of is that this level of demand is not transitory.

## Package aims to tempt dealers

PROGRAMMES Technology, subsidiary of the telephone sales outfit Programmes Limited, is on the hunt for dealers to sell its own-label machine. But it claims to offer more than just the Programmes General micro: it is putting together a whole marketing package, including identifiable sales leads and a telephone sales campaign from its parent company.

"Our thinking is that machines come out at the rate of two a day," says Programmes Technology marketing director Martin Hill-Wilson. "You've got to do something that will interest dealers. We don't think a touch-screen or mouse is the way to do this."

"We have a reliable eight-bit business micro and some good software, but the general applications market is difficult to identify. Programmes Technology was set up in September last year, not two years ago as stated in an earlier issue."



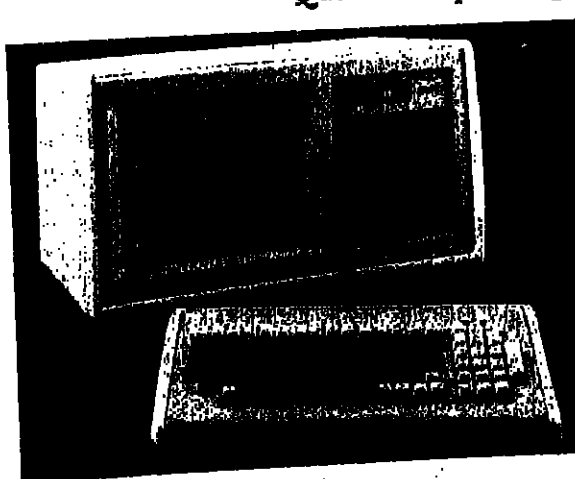
## This is ridiculous!

Don't put your customers in this position by selling PCs to businesses that are liable to grow. We all know that a business might start by buying a computer with one job in mind, but it seldom stays that way. If it's bought for accounting, they'll soon get the idea of adding financial planning, word processing and numerous other applications.

In a business that's growing that means more and more people will want to use the computer, eventually at the same time. And if you've sold them a PC they can't.

On the other hand, if you'd sold them an Equinox multi-user multi-processor system at the start, they could have expanded as the need arose.

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CP/M 80™, CP/M 86™, MS DOS™, MBOS™ are some of the operating systems we run. And for real high-speed multi-processor networking power there's the TURBOdos™ operating system.

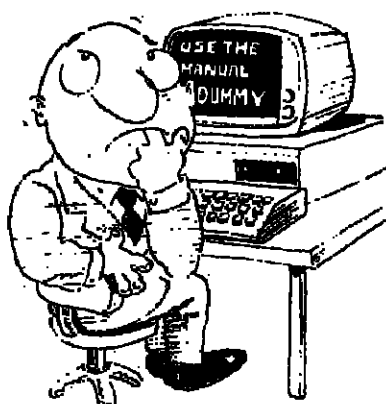
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COMPANY NEWS

# Norsk profits double to £6.3m

NORWAY'S premier computer company chose London as the location to announce its annual results last week.

Norsk Data, arguably the most impressive indigenous computer company in Europe, has reported pre-tax profits of 93% at £6.3 million on turnover ahead 42% at £77.7 million, based on unaudited figures for the year ending December 31, 1983 (converted at NOK 11.2/£1).

The company has improved its profit margins to 15.5%, which brings it closer to its American competitors, and is quite exceptional for a Norwegian company.

Rolf Skar, president and chief executive officer of Norsk Data, said to London: "It is no secret that we are very proud of our growth rate - it is an enormous internal driving force, and it provides a lot of challenge and motivation."

But Skar added: "What is more important is the position of book-ings."

Orders received in 1983 rose 65% to £87.5 million. At the moment, the company's business splits 50-50 between scientific and commercial machines, though the highest growth is the commercial field. About 60% of its revenues came from exports.

In the UK, Norsk Data managed a 100% improvement in turnover to around £5 million. It is in the process of establishing a UK and central European headquarters at Benham Park, Newbury, and it is rumoured to be close to a joint venture with another UK company.

It is significant that Skar should choose to announce the results in London, because the company charts its flowering from 1981 when it became the first Norwegian company to have a London

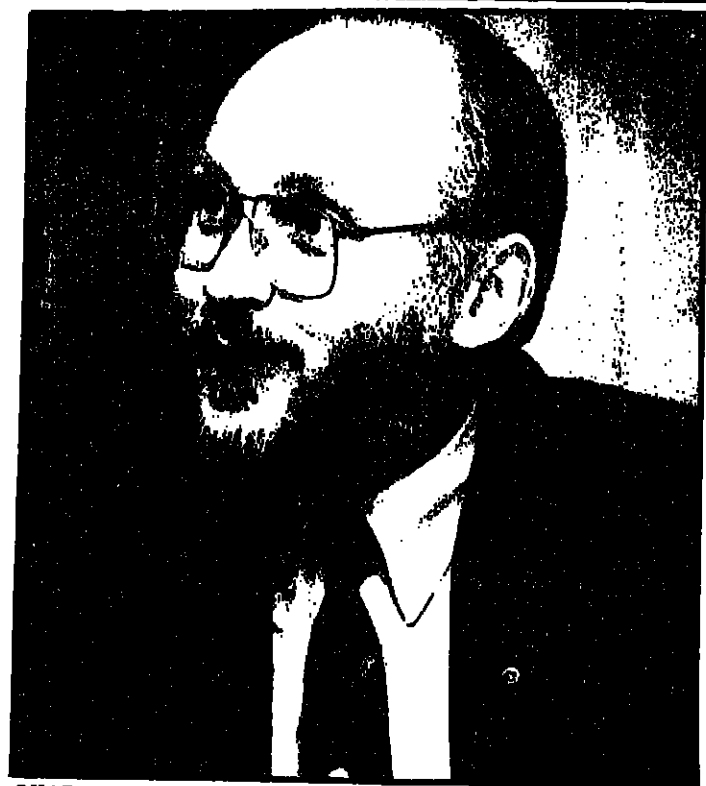
Stock Exchange listing.

In May 1983, the company began trading over-the-counter in New York, making Norsk Data the only European computer company with access to the US equity capital market.

Both the profit and turnover figures include contributions for the second half of the year from Norsk Data's two acquisitions in 1983. In July, it took a controlling interest in a bureau serving the Swedish forestry industry, ND Silvdata, which contributed around £4 million revenue.

Norsk also completed its acquisition of the loss-making German mini-maker and CAD specialist, Dietz. Norsk Data Dietz had turnover of £8 million, but its profits were modest and dragged down the company's overall margins.

Norsk views the Dietz project as central to its ambitions in German-speaking countries.



SKAR... "No secret that we are very proud of our growth."

Skar concluded that Norsk Data "had never been in a better position". It had not doubted its ability to produce technically com-

petitive products, but now he had the marketing ability and financial influence to take a "major role" in the European market place.

## Harrison scraps third of workforce

A TOTAL of 43 of the 130 staff at Harrison Industrial Development, the holding company for H.H. Microcomputers, have been made redundant. H.H. went into receivership two weeks ago. William Roberts, the receiver from Ernst & Whinney, tells us that there have been approaches for the microcomputer business, but that any deal will be at least a month away.

## Radius acquires

RADIUS, a software house based in Hull, has acquired the data products division of Geest Computer Services, DPD, for an undisclosed sum. Radius says that DPD was one of the UK's first suppliers of Texas Instruments, and it describes the move as a strengthening of its commitment to this company. DPD is based in Birmingham, and it gives Radius a foot in the Midlands. This is the second acquisition that Radius has made in six months - the other was Hyman Computer Services of Manchester.

## Xyllyx success

XYLLYX, a viewpoint product company, is set to join the Unlisted Securities Market next month. Anglo Dutch and Kemp Mitchell are expected to place 3.5 million shares, about 17% of the equity, to raise £2 million for the company. The cash will go towards research and development and working capital. Xyllyx's products include a coin-operated systems, which it picked up when Information Services and Equipment, a National Enterprise Board outfit, fell over. There are no pricing details yet - though estimates of a placing price as low as 60 pence do not disguise the fact that this is one for the brave.

Stern's report that he has halved his company's losses over the past year follows a 28% rise in sales for the first half of 1983. He had also forecast a 40% improvement in sales for the entire year.

Stern's big problem is that, under state control, Bull cannot undertake the improvements in productivity and prune its staff as dictated by the logic of the firm's predicament. It carries a cumbersome product range and it cannot shed these without losing its traditional customer base.

Stern's personal record at the head of SESA, one of France's leading software companies, has



STERN... "Confidence."

## AB extension

AB Electronic Products, which was awarded a contract to supply printed circuit board sub-assemblies for the IBM Personal Computer last December, and does sub-contracted work for Acorn, is enlarging its facilities in South Wales. The decision could mean 200 new jobs at the Rogerstone and Pontypridd sites. Construction work has started to extend the two Welsh Development Agency factories at Rogerstone into a 100,000 square foot complex.

## Ferranti closure

FERRANTI has announced closure of its loss-making, container-handling equipment division in Chadderton, Lancs. The move will mean 330 redundancies, and will cost Ferranti about £1.5 million. Ferranti Container Handling has lost some £5 million over the past five years. The closure could mark Ferranti's withdrawal from traditional heavy engineering industries.

## Compass created

TECHNOLOGY Solutions of Reading has formed a new company, Compass Computer, based at Tetbury, Gloucestershire. The company will offer add-ons, such as communications boards, and peripherals for DEC machines from Rainbow to the micro PDP-11. Compass will also market a multi-user micro system - the Compass 32.

## Quorum query

QUORUM Computers of Southampton, which has just sold 35% of its equity to Moracrest Investments (Computer Weekly, January 12), has announced that its workforce has halved since 1981, not since the management buyout from Q1 Europe last year. The company also is curious to know if Sinclair Research really intends to call the local area network for the new QL. Quorum has a registered system with the same name.

COMPANY NEWS

# DEC lives through its crisis...

RARELY can a mere second quarter's financial result have been awaited with such curiosity as DEC's last week.

In the end the company survived its moment of truth and was able to confirm modest recovery after its disastrous first quarter return.

DEC announced net earnings for the quarter ended December 31, 1983 up 32% at \$80.48 million on revenues ahead 40% at \$1.42 billion. That has helped DEC post half-year interim earnings down just 18% at \$96.3 million on revenues up 28% at \$2.5 billion compared with the first half of 1982.

So DEC can breathe again. But one quarter "dust not a summer make", and there remains significant scepticism about whether the company is out of the woods yet.

DEC's share price collapsed last October - to a year low of \$64 - when the company reported profits down 72% in the fiscal quarter ended September 30. It has come back around 15% in the last few weeks as the recovery was promised, and eventually materialised, but it is hard to take DEC's founder and president Ken Olsen seriously when he declares that "we've never been stronger."

Certainly, the company has solved some of its more pressing problems. A spokesman for DEC in Maynard, Massachusetts, told

"The problems of the last few months are behind us - a lot of things happened all together and exaggerated the situation." He added that "the improvement has come because the personal computer shipments have picked up substantially; there is significant demand for the Micro PDP-11, and for Vax 11-780s and 11-750s. We will be making aggressive product announcements for the rest of the year."

Nonetheless, DEC still has a lot of catching up to do before its personal computer business will be taken seriously. It faces a growing challenge in its traditional minicomputer market from a host of super mini makers - Data General, Prime, Norsk Data, Perkin-Elmer - all of which can offer machines to outperform DEC's range. The new generation of Vax is more than two years late, and DEC desperately needs to produce it later this year.

Similarly, no corporation, including DEC, can shrug off the loss of an estimated 50 product line managers, and six senior vice-presidents, in less than one year.

DEC shares must look like a bargain now, at 75 against a 1983 high of 130, yet Wall Street analysts still seem reluctant to commit themselves to the stock. They are relieved that DEC has come back so far so soon - but they remain to be convinced.



OLSEN... Hard to believe.



HENSON... Unrepentant.

## ...and the rest have mixed fortunes

WHILE DEC was heaving a sigh of no little relief there was mixed fortune for the rest of the bunch. Burroughs' recovery continues - it has now managed a major turn around in 12 months.

For the full year to December 31, 1983 net profits rose 67% to \$196.9 million. Turnover improved marginally, up 4% at \$4.39 billion. In the fourth quarter it turned a \$15.6 million loss a year ago, to an \$81.4 million profit. Turnover rose 17% in the period to \$1.31 billion.

Michael Blumenthal, Burroughs' chairman, has taken the company to pieces and put it back together since his arrival in 1980.

Blumenthal said that orders in all the major product groups "strengthened in the fourth quarter, with both our domestic and international operations achieving substantial gains."

The same cannot be said for Prime. Its fourth quarter profits fell 18% on the same period in 1982 to \$10 million, despite a 21%

rise in turnover to \$142.8 million. For the full year the mini-maker saw net profits down 28% at \$32.5 million on turnover up 18% at \$516.5 million.

Prime president Joe Henson was unrepentant, claiming that the figures belied "substantial progress" in terms of revenue growth and expense management.

Gould's 1983 figures tell a similar story. The company reported static earnings of \$79.2 million on sales up from \$1.25 billion to \$1.32 billion. But the group recorded a loss from discontinued activities which has depressed the net profits to just \$64.1 million.

However, fourth quarter earnings rose 22% to \$25.2 million on sales up 10% at \$342.3 million.

And mixed fortunes for Control Data. Improvement in computer related business was offset by fall in earnings from financial services.

In the full year net earnings increased from \$155.1 million to \$161.7 million on sales up from \$4.3 billion to \$4.6 billion.

# Microgen seeks full listing

MICROGEN HOLDINGS, which specialises in high-speed data recording, and which joined the Unlisted Securities Market last year, is seeking a full Stock Exchange listing.

The announcement has put icing on an already rich cake. Microgen has just reported pre-tax profits up 57% at £926,000 on turnover ahead 27% at £3.51 million for the year to October 31, 1983.

Patrick Barbour, chairman of the company, says that a thorough productivity drive has produced a significant improvement in margins and profits. The company seems to have established computer output microfilm as a viable product and looks for a substantial growth in the market.

This year should see a healthy contribution from Systonair, a computer-aided photo typesetting business acquired in 1983.

Microgen was brought to the USM by broker Laurence Prust in January 1983 in a placing of just 10% of its equity. Its progress to a full listing was described by one company spokesman as "very, very quick."

Microgen's shares opened at 190 pence, and although they have ended to fluctuate, they now stand at around 430p. In fact, Microgen's performance made it the sixth best new USM issue in 1983.

The current price capitalises the company at some £14 million and gives it an historic price/earnings ratio of over 30 - a function of its high-tech tag, as much as anything else.

Microgen's performance suggests that it can indeed justify promotion to the official list. The company is looking for profits

around £1.5 million in the current year. Its name has been linked with National Westminster's computer output microfilm subsidiary.

One high-technology company that has made the transition from USM to full listing safely is Star Computer Group.

The company has reported pre-tax profits up from £232,000 to £320,000 on turnover increased from £2.22 million to £3.12 million in the six months to October 31, 1983.

Last year, Star returned pre-tax profits of £1.07 million, and the company points out that it invariably has a slow first-half. It says that the order book looks good and that Star should manage a similar improvement for the full year.

Star is to launch a new range of microcomputers, based on the Convergent Technology NGen and Megafire workstations.

Financial editor Dave Madden comments:

"The Unlisted Securities Market was conceived in 1980 in response to the Wilson Committee's criticisms of the City for its failure to encourage small companies."

Since it was inaugurated in November 1980, some 200 companies have gone onto the market - raising over £700 million. Despite the casualties - including I Technology - the fact that the USM has still to prove its stability in a falling market, and the talk of a shake-out, the USM has fulfilled that role with conspicuous success.

But the USM was not designed to be an end in itself. Its ultimate raison d'être is to act as a nursery for the full market.

So Microgen's decision to apply for a full listing will be all the more significant if it encourages other USM companies to make the transition.

## New system for small firms

DAVID Trippier, the minister responsible for small businesses, has announced that companies seeking government contracts will in future be required to fill one standard questionnaire.

At present, companies must supply different financial and general information every time they pitch for business. Now suppliers are required to refer purchasing staff to their original form.

The new procedure should be introduced by June.

## SHARES TABLE

The shares table, which is specially compiled for Computer Weekly, shows selected company companies that reflect the state of the computer industry.

Previous published index 128.85 Index 134.11 Change +5.26

Pence		London Stock Exchange		Pence		5 US Stock		5	
1984		1983		1984		1983		1984	
High	Low	High	Low	High	Low	High	Low	High	Low
328	299	Ableworth (10p)	238	1	45	231	14	Arnslett	27
355	314	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
362	342	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
30	28	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
17	16	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
17	16	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
146	142	Adl (Reg Comp) (2p)	65	45	289	272	10	Asplins	27
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## PROFILE

# Man who made a micro spectacle in the City

IT comes as a surprise to hear Clive Richards, the ubiquitous and impressively self-assured chairman of Micro Business Systems, call anyone God — even his bank manager. But that's exactly what he called Richard Cole-Hamilton, chief general manager of the Clydesdale Group, and the man who formally opened Micro Business Systems' new Scottish headquarters in Glasgow.

It's a surprise because the imposing Richards almost epitomises the wheedling-dealing pin-striped suited City slickers.

by Dave Madden

There's nothing ordinary about the man — or his office. In a city not famed for its elegance, MBS has found itself an immaculate Georgian town house — once Glasgow's Burlington Banqueting Centre — at a mere £70,000.

MBS has good reason to "belong" to Glasgow. Its largest single customer — the identity is guarded jealously — is in Scotland, and as Richards comments: "The Clydesdale Bank has the good sense to lend us £1 million". If, as tradition has it, Scots are careful with their money, then they can be well pleased with that investment: Micro Business Systems was one of the most spectacular performers on the Unlisted Securities Market in 1983, with a 150% gain on its share price.

But MBS was hardly a long shot. Richards' pedigree is legend: variously managing partner of stock jobbers Wedd Durlacher Moradoun, chief executive of Rothschild Investment Trust, and group finance director of NM Rothschild & Sons, chairman of Norrie Hill and owner Clive Richards & Co, an investment company.

## DOWNTIME

## Insecurely ditched

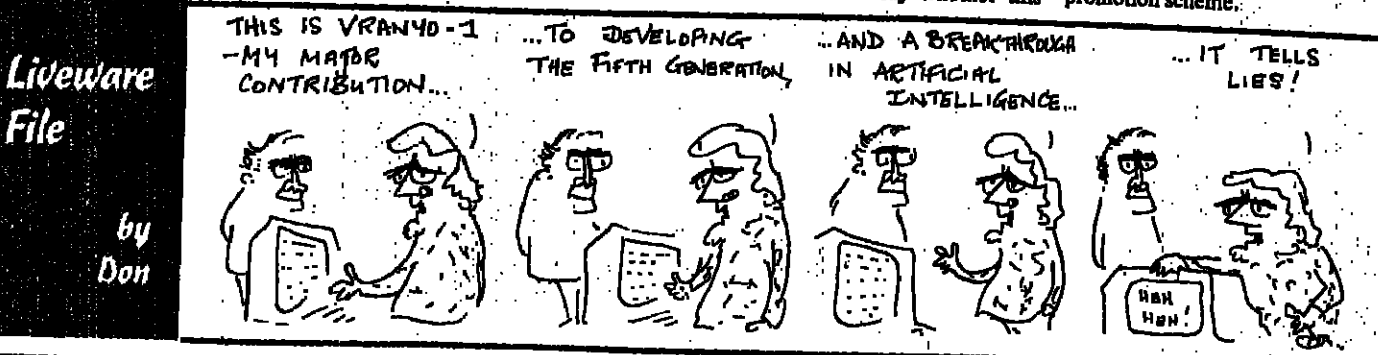
WHILE our government struggles with desperate remedies to seal its own leaks and wring out the wets, it is clear that West Germany has its own problems.

Had you taken a stroll last October in the Biffl mountains you might not have taken any notice of a thick wad of computer print out lying in a ditch.

But had you bothered to peruse, you might have been taken aback by the contents. It listed the West German armaments programme in its virtual entirety.

The German *Stern* magazine reported the find, but refrained from divulging the beans.

According to *Stern*, it was not clear whether the lists had been lost during transport, or placed in the ditch by a secret agent.



Chad



RICHARDS (left) with the man he calls God — Richard Cole-Hamilton.

Richards says: "Corporations have a deep suspicion of private companies. The USM has been a financial success and it has brought respect".

A recent report commissioned by accountants Spicer and Pegler, entitled *The USM Experience*, suggested much the same. Almost all USM companies it approached said that status and prestige was the most valuable advantage of becoming a public company.

This business of credibility is a subject that Richards and Brooke warm to. They explain that when approaching a corporation they find themselves "selling to a purchasing department rather than an office manager — a 'purchasocrat', not a technocrat — who will ask not only if we will be around in five years time, but whether our suppliers are stable too".

If the company has a priority for 1984 it is to consolidate the progress it has made since venturing on to the USM.

"We intend to capitalise on the investments made in 1983, which with Alvernic, the regional office development, and the new divisions adds up to a lot of money," says Richards.

But that does not exclude opening another regional office in the spring — or applying for IBM dealership for it.

The prospect of MBS applying

## Des. res. in heart of the City

WHEN the Swedish company LM Ericsson took over Datasab, one of the things its UK subsidiary found it had inherited was a small building in the heart of the City of London.

The size of a small terraced house, the building has just one room on each of its three floors. Ericsson managing director, John Bunce, said he didn't know what to do with it at first, but it has turned out to be a useful little City base, which provides a small office, a demonstration room and a sitting room or bar. Handy for meeting prospective customers informally.

It also happens to be right across the street from British Telecom's head office.

Bunce didn't say whether this

## Nice, but . . .

SEEN one of those natty new telephone plugs yet? You know, the little fobs designed to replace the cumbersome old jack plugs that BT has been using since about 1978. Nice aren't they? Pity they're illegal.

It appears that someone managed to cock up the draft for the new British standard for the things. The BEC has decided that any voltage over 50 is a jolly bad thing to allow people to come into contact with, and demands that any new electrical gizmos must be made secure from probing human extremities.

Enter the British Standard Finger. This mythical digit exists for the sole purpose of judging whether or not electrical gubbins are likely to give one a nasty shock. If the British Standard Finger won't go into any of the holes, the thing is deemed safe.

Trouble is, the wording on the British Standard for the new Telecom connector omits the word "standard". Thus any finger attached to a British subject will do.

This, of course, covers British subjects aged from 0 upwards, many of which have British fingers perfectly capable of fitting into the new connectors. The thing is, therefore, illegal until such time as the standard is changed. And that could take some time.



Chad

## PLATFORM

## The human system that no one can ignore

WHEN computers first came into the commercial scene in the early 1960s, payroll was an obvious candidate as the first system for computerisation.

The processing speed, power of calculation and the general administrative capabilities of computers ensured that the payroll would be processed easily in an accurate and timely way.

In some cases, a small amount of personnel recording was also carried out within this type of system, but there development stopped, so that computers could be used for more "interesting" functions such as ledger accounting, stock control, manufacturing, financial planning and asset control.

But we are now beginning to see the first fundamental change in payroll and personnel since these early days.

It is called human resource management, and it is going to change so much in the field of payroll and personnel management over the next few years that no organisation can afford to ignore its impact.

At present only the very largest of commercial organisations have paid any attention to this topic, but shortly it will have to be addressed in all organisations.

As organisations slim their workforces a need to keep the right people is important. It is also necessary to ensure that the manpower is kept in line with the manpower budget.

From this we can extend into manpower planning which is matching up the ideal with the actual — where there are vacant or over-budget positions, where individuals are out of specification, the costs of these exceptional situations, where there are budgeted positions which are no longer relevant — how we can make the workforce more efficient and, finally, by matching suitable individuals in the organisation.

These and many other reasons have resulted in a need for much more effective management of human resources.

The impact of statutory sick pay (SSP) has necessitated closer co-operation between payroll and personnel departments, both jealous of their own responsibility and often at loggerheads.

Tim Southern and Dick Osborne

Tim Southern is managing director and Dick Osborne is product manager, Human Resources of the Payroll/Personnel Division of Package Programs Ltd.



All this has resulted in the evolution of human resource management systems of which payroll is just one important element of a total system. It has also resulted in the evolution of combined payroll/personnel departments in forward-looking organisations.

The natural trend, therefore, is to an integrated payroll and personnel system, where common information is held only once.

This evolution is not going to take place without trauma and pain. Payroll staff will have to control a much wider content of information, personnel staff are going to have to understand the importance of timeliness of processing, and both are going to have to come to grips with the more modern aspects of computerisation.

Despite this salutary trend, there is increased awareness that employers need to know more about their employees. In current jargon this is human resource management.

The primary function can be described by the phrase "position control". Ostensibly it is the manpower budget, and a single record must be established for each budgeted position.

It can, however, be expanded by setting out the criteria of what the holder of the position must have, such as educational qualifications, skills, relevant experience and so on.

More and more the management of organisations require details and statistics of their workforce so that correct investment decisions can be made and a proper control maintained on costs. In many organisations the labour cost is of the order of two-thirds of the total cost which demands proper manpower control.

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# Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, February 2, 1984

## These are just cosmetic touches

THE Data Protection Bill shows all the signs of being a salutary lesson to the UK computer industry on its need to have an effective and coherent voice in the corridors of power.

Widespread opposition remains within the industry to the Bill as it currently stands at the end of its second reading in the House of Commons. That opposition has been increasing since it was just a twinkle in a Home Office Minister's eye, and a White Paper was first tabled in the House. The Bill, however, grinds relentlessly on with a few cosmetic touches slapped on to allay criticism.

As to the Bill's possible effectiveness in preserving the liberties of individuals, it is difficult for anyone to seriously consider it as anything other than a legal device to allow the government to ratify its signature on the European Convention which relates to data protection.

And there are reasonable doubts that it will accomplish even this limited aim.

But, under the general rule that government and its attendant bureaucracy will do as much harm as it can get away with and as much good as it must, the Bill can and probably will have a significant effect on the computer industry.

The Bill was supposed to be designed for the computer industry. When then Home Secretary William Whitelaw announced in 1981 that the government intended to ratify the European Convention, he made it clear that the main impetus for the move was commercial.

The government wished simply to make sure that UK bureaux and database providers were not cut off from Europe by a failure of the UK to comply with various laws passed by EEC countries which limited the flow of data across national borders.

Providers of this sort of service must be crossing their fingers and hoping that the government fulfils its intentions.

The rest of the industry will have another set of regulations to obey, probably at some cost, in complying with the yet to be announced standard of security of personal information.

Small systems houses could find that their activities are limited just by waiting to gain approval from the registrar for the security systems that they intend to implement for their customers. Large companies will have the resources and time to go through the lengthy procedures which will probably be erected — small ones are likely to have great difficulties.

These are problems that the industry may have to face. It would have been better had they been more widely discussed by Whitehall legislation drafters and MPs.

## DoTI must listen

THE government has acted quickly to answer criticisms that its microcomputers in schools scheme is floundering for lack of software and support. The Department of Trade and Industry is to announce in March that it will back a multi-million pound scheme to develop educational software.

In our January 12 issue we criticised the government for short-changing the teaching profession by offering it equipment, but not the know-how of how to use it. Now it seems that the DoTI is going to act quickly to rectify the anomalies in the scheme. Although it is unlikely that the DoTI has reacted to our concern with the scheme's problems, we nevertheless applaud their prompt action.

The details of the DoTI's support for software in secondary schools are not yet known, and it is important that they are scrutinised carefully when released.

Hopes have been expressed that the UK could become a world leader in educational software. That will only happen if the DoTI listens carefully to what teachers say their needs are, and to what the software industry says it can do to supply those needs.

The newly organised DoTI, with its new emphasis on export markets, must not let this opportunity go begging.

## 1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Les Mercer of Farnborough, Hants, who writes:

Rewinding history via back numbers of *The Times*, for instance, today would be a simple matter of hitching up a word processor to a microfiche.

Keith Waterhouse, *Daily Mirror*

## LETTERS

## Think again, you Transbasic Challenge critics

JUDGING from the recent correspondence in your columns regarding the Computer Automation Transbasic Challenge, and reading between the lines of the opinions expressed, my guess is that poor Messrs. Pilkington and Seymour have had a shot at it and come up against some of the more common problems which one may try to implement multi-user applications on unsuitable systems.

Far from our competition being treated with "derision", as Mr Seymour thinks, everyone who has taken up the challenge, and there has been a far greater response than we ever expected, has entered into the spirit of the competition in a most positive way.

It is unfair to the contestants who have expended time, effort and a lot of ingenuity in rising to the challenge for Mr Seymour to suggest that they are wasting their time.

All the contestants have shown a great appreciation of the whole problem and an ability to resolve difficulties in an inventive way, which contrasts markedly with the negative criticisms expressed in your columns.

Our contestants, in fact, are

most from commercial organisations having to earn their crust of bread by programming, which they clearly do with a high level of ability. We have also been encouraged by the strength of the agreement with the article *Computer Weekly* published as background to the competition.

Since the entrants have had the nous to interpret the problem in a thoroughly practical way, it is unnecessary to provide a blow-by-blow rebuttal of the points raised in your columns. Only three general points need be made to deal with them.

It is quite clear that the flowchart represents only a simple example of the basic functions needed to be performed in a real system. A real life application would include a large amount of user directives, messages and help information, field and data type validation etc., but however necessary this is to the application, it does not exemplify any further functionality needed in a multi-user environment than is included already.

Any designer worth his salt knows that the amount of code needed for dealing with error recovery and invalid input far outweighs that needed to implement the central function when everything is OK. This is as true of single user systems, as multi-user systems and adds nothing to the flowchart.

When drawing up different languages and systems would probably enable some function boxes to be concentrated into single statements. This would result in an obvious advantage for that language, and be reflected in the score. The object of the exercise is, after all, to win!

Also, if Mr Pilkington's system needs to change all the data on the screen to change just one field, perhaps he would like to try using Opus and Transbasic which does not. It also, incidentally, does check for validity of numeric fields.

We do accept that we may be at fault here in believing that this last requirement was so fundamental to a usable language, that it was not necessary to put in explicit checks.

Lastly, on the subject of record locking, great care has to be exercised here. In a real time, multiprogramming operation

system which locks files at the record level, it could be possible for requests for disc access to be enqueued (or de-queued) in a different order from that in which the requests were issued.

It is therefore more reliable for the disc driver to unlock the record after the transfer has taken place successfully, rather than leaving the responsibility for releasing the record in the hands of the application program.

Some systems also leave the responsibility of locking the record in the first place to the disc drivers, locking it at the initiation of the read-access to the record, as well as unlocking it only after the write-access is successfully completed.

In conclusion, I would like to thank our competition entrants for their excellent responses, invite Mr Pilkington, Mr Seymour and Mr Higham to visit us (or one of our distributors) for a hands-on session with Opus, and look forward to the difficult task of finding a winner for the presentation of the prize in a few weeks' time.

ROGER CHARTERS

Marketing manager, Computer Automation Rickmanworth.

United Leasing London.

payments are still appropriate. Perhaps of still more relevance is the fact that we have fallen into line with the established industry practice which is not just limited to computer leasing companies.

If analysts are to value our company properly, it is better that they compare apples with apples rather than each company claiming it is a special case.

Secondly, there has been considerable comment by the respected financial press as to whether valuation of companies on the basis of notional corporation tax-

ASHLEY H. MITCHELL

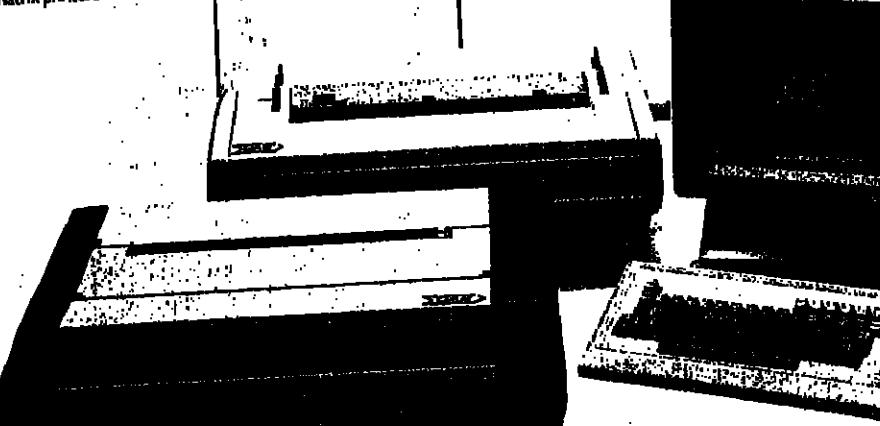
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## USER SURVEY 1983

# Cobol slithers from its peak

Use of Cobol has declined according to the 1983 user survey. John Riley examines this and other important results

COBOL is still the dominant primary programming language used on mainframe and minicomputer sites, but it has fallen from its peak of 1982 and may have started on a long-term decline. Meanwhile, the use of Basic has increased among mainframe and mini users, use of Assembler and PL/I is more common on mainframes, and use of Fortran is slightly up on last year in the minicomputer sector.

These findings arise from the 1983 Computer Weekly/Datapro

## IBM's own languages have mixed fortunes in the mainframe section

user satisfaction survey - the largest survey so far.

The questionnaire asked users to state their primary programming language, sources of their applications programs and the principal applications to which their systems are put. By comparing the results with those of previous years, it has been possible to pick out general trends in these areas.

Nearly 66% of the 819 mainframe user respondents use Cobol as their primary programming language. It has fallen from its peak of 71% in 1982, which was 3% up on

the 68% of mainframe user replies in 1981.

It is possible that this result could mark the beginning of the decline of Cobol, which has been widely predicted to begin during the latter part of this decade onwards by various software gurus, including James Martin, chairman of international consultant DMW.

The overall percentage shift is heavily influenced by the 396 IBM mainframe users who responded. In the 1983 survey 55% regard Cobol as their primary programming language, whereas in 1982 and 1981 the proportion was 61% and 53% respectively.

The shortfall in the use of Cobol in IBM mainframe establishments is counterbalanced by increased proportions of users reporting that Assembler and IBM's own programming language, PL/I, are their primary languages. There is a 5% increase in PL/I (to 18.5%) and a 10% increase in Assembler (to 15.2%) use.

The shift to Assembler by IBM mainframe users perplexes John Grant, chairman of the IBM Computer Users Association. "The result for PL/I could be explained, but the Assembler result amazes me," he says, "that is very strange." He adds that IBM has not particularly pushed PL/I over the past year.

One company that has its future tied up with that of Cobol is Micro



Most users need their equipment for accounting applications - although this number is down.

Focus. Among other offerings, it provides Personal Cobol, which enables IBM PC users to write Cobol programs for IBM mainframes.

Peter Hewitt, Micro Focus' UK marketing manager, says that the number of installations is growing, giving an overall real increase in the number of Cobol users.

Fewer Sperry and Honeywell mainframe users say they are employing Cobol as their primary programming language this time.

However, while Cobol's use on Honeywell installations remains very high (nearly 89%), there is a 13% drop in the number of Sperry sites using it (to nearly 68%).

Cobol remains popular with ICL users (nearly 84% of them), while 15% more of the NCR and Burroughs users report using it compared with the last survey.

IBM's own languages, PL/I and RPG have mixed fortunes in the mainframe section. Reported PL/I use grows overall: it is the predo-

minant language for 10.2% of respondents this time, compared with 6.9% last survey. That growth is mainly due to increased use by IBM and IBM plug compatible users.

However, RPG use on mainframes declines for the third successive year: from 3.2% in 1981 to 2.2% in 1982 and now to 0.6% in 1983.

Assembler and Basic are both increasing in use on mainframe sites, according to the survey. The percentage of respondents using Assembler as their main language has increased for the third year

frames, with 8.4% of ICL's 196 respondents using it as their chief language, compared with 2.4% last time.

The scientifically-oriented language, Fortran, is down slightly among mainframe users this year. That trend may be linked with the slight decrease in scientific and mathematical applications reported by mainframe users.

Turning to the minicomputer and small business systems section of the survey, Cobol again dominates, although slightly down overall (from 32.4% to 31.2%). The biggest drops in use are found among Honeywell, Data General and Prime users, although Cobol's use on IBM minicomputers nearly doubles to 8.7%.

From the survey, the use of Cobol is particularly high among NCR and Burroughs users. There has also been a big increase in Hewlett-Packard users using Cobol as their primary programming language, perhaps reflecting its push deeper into the commercial market.

In the minicomputer and small business sector, IBM's language, RPG, is down overall for the third year running from 20.8% in 1981 and 19.6% in 1982, to 16.1% this time. The decline in use of RPG among IBM users in this sector seems to be accelerating - from 9.4% in 1981, to 9.3% in 1982, to 8.5% last year.

The proportion of RPG use at Hewlett-Packard, Honeywell and ICL minicomputer sites has also

THE 1983 Computer Weekly/Datapro user satisfaction survey was the largest of the annual surveys so far. There were 2,664 user responses, of which 819 were mainframe users and 1,245 were minicomputer users. As the same questions were asked in previous years, the 1983 responses can legitimately be compared with those from the previous surveys.

The user survey, which involved sending detailed questionnaires last September to a random sample of 10,000 UK mainframe and minicomputer installations, was divided broadly into two parts. Last week, we looked at the first - at users' satisfaction with their mainframe and minicomputer systems.

This week, we examine the second part of the survey, which asked users how they are working their systems.

running, from 6.1% in 1981, to 7.2% in 1982, to 10.4% in 1983. Basic is enjoying increasing take-up, although its use is still on a small scale - up to 3.1% from 1.3% overall. Basic is especially more widely used on ICL main-

frames, from 6.1% in 1981, to 7.2% in 1982, to 10.4% in 1983. Basic is enjoying increasing take-up, although its use is still on a small scale - up to 3.1% from 1.3% overall. Basic is especially more widely used on ICL main-

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## USER SURVEY 1983



GRANT... "The Assembler result amazes me."

make inroads into the upgrade market for the ageing IBM System 34.

The use of Basic on minicomputer installations is up slightly overall. Although more DEC and Sysline users employ Basic as their main language than any other manufacturer's users, the proportion using Basic is down. More IBM, ICL, Hewlett-Packard, Honeywell and Data General users are going for Basic, according to the survey.

The use of Fortran as the primary language for minicomputers is also up slightly, from 9.9% to 13.0% overall. That can probably be linked to the increased use of minicomputers primarily for engineering, scientific and statistical

## The use of Fortran as primary language for minicomputers is up slightly

applications (Figure 5). Fortran is most likely to be the main language on DEC, GEC and Prime minicomputer sites, according to the survey.

There is a small increase in the proportion of languages not singled out in the tables in the minicomputer section. Among these languages, Pascal gains a little ground, from 0.5% in 1982 to 2.0% last year, mainly due to its use on a handful of ICL, Norsk Data, Perkin-Elmer, Prime, DEC, Honeywell and GEC sites. APL is the main language for 1.5% of Prime users.

Users were asked to list the main sources of their applications programs. In both sectors there is a continued boom in the proportion of users purchasing proprietary software packages (Figure 2). The main source overall is once again from in-house personnel, and the proportions are up on last year.

There is mixed news for contract programmers. They are

Name of manufacturer	User responses (minimum of 10)
<b>MAINFRAMES</b>	
Amdahl	17 (7)
Burroughs	35 (9)
CTL	14 (5)
Digital Equipment	12 (5)
Honeywell	50 (27)
IBM	396 (130)
ICL	196 (83)
NCR	20 (14)
NAS	10 (-)
Sperry	61 (21)
Others	8 (25)
Total	819 (321)

Name of manufacturer	User responses (minimum of 10)
<b>MINICOMPUTERS AND SMALL BUSINESS SYSTEMS</b>	
Burroughs	59 (37)
Data General	39 (32)
Datapoint	18 (12)
DEC	271 (101)
GEC	29 (4)
Hewlett-Packard	90 (33)
Honeywell	56 (28)
IBM	216 (104)
ICL	189 (98)
Microdata	32 (-)
NCR	25 (14)
Perkin-Elmer	17 (4)
Prime	56 (18)
Sysline	43 (18)
Texas Instruments	15 (11)
Wang	14 (7)
Others	76 (90)
Total	1245 (633)

Fig. 3: Number of participants in the survey.



MARTIN... Predicted decline of Cobol.

Manufacturer	Assembler 1983 (1982)	Basic 1983 (1982)	Cobol 1983 (1982)	Fortran 1983 (1982)	PL/I 1983 (1982)	RPG 1983 (1982)	Other 1983 (1982)
Amdahl	27.3 (0.0)	0.0 (0.0)	27.3 (28.6)	13.6 (28.6)	18.2 (42.9)	0.0 (0.0)	13.6 (33.3)
Burroughs	0.0 (0.0)	2.2 (0.0)	82.2 (66.7)	2.2 (11.1)	0.0 (0.0)	4.4 (11.1)	8.9 (11.1)
CTL	5.6 (0.0)	5.6 (0.0)	77.8 (100.0)	5.6 (0.0)	0.0 (0.0)	0.0 (0.0)	5.7 (0.0)
DEC	7.1 (0.0)	14.3 (30.0)	14.3 (0.0)	35.7 (80.0)	1.9 (0.0)	0.0 (0.0)	1.9 (0.0)
Honeywell	0.0 (0.0)	3.7 (0.0)	88.9 (96.3)	4.6 (3.1)	18.5 (13.2)	0.0 (1.2)	2.5 (7.2)
IBM	15.2 (4.7)	0.9 (0.0)	83.6 (83.1)	4.6 (4.8)	0.0 (1.2)	0.0 (-)	0.0 (-)
ICL	0.8 (0.0)	8.4 (2.4)	23.1 (-)	7.7 (-)	38.5 (-)	0.0 (0.0)	14.3 (28.6)
NAS	30.8 (-)	0.0 (-)	85.7 (71.4)	0.0 (0.0)	0.0 (0.0)	6.2 (4.7)	0.0 (0.0)
NCR	0.0 (0.0)	0.0 (0.0)	67.7 (81.0)	1.5 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (4.0)
Sperry	24.6 (14.3)	0.0 (4.0)	57.1 (72.0)	14.3 (12.0)	28.6 (4.0)	0.0 (0.0)	0.0 (4.0)
Others	0.0 (4.0)	0.0 (4.0)	0.0 (4.0)	0.0 (4.0)	0.0 (4.0)	0.0 (4.0)	0.0 (4.0)
Total (819 responses)	10.4 (7.2)	3.1 (1.3)	65.6 (70.9)	5.0 (5.9)	10.2 (6.9)	0.6 (2.2)	2.7 (5.6)

Figure 4: Primary programming languages - mainframes. Percentages of users employing each language.

application, although, overall, that application is down in both sectors. Payroll and personnel functions are the second most frequent application areas for mainframes.

## Accounting is still the most common application, although down in both sectors

but, among minicomputer users, payroll and personnel take third place after order processing and inventory control.

The main increase in mainframe

applications is in the banking sector (up from 14.3% in 1982 to 21.9%). In the minicomputer section the largest increase is in engineering and scientific applications (from 13.7% to 22.0%).

Datapro will publish the complete results of the survey in a report, entitled *British User Ratings of Computer Systems*. Copies of the report, at 62 Swiss francs each, may be ordered from Datapro Services S.A., CH-1164, Buchillon, Switzerland.

CTL was included in the mainframe section by Datapro in this survey, although it is normally best considered as a minicomputer vendor. In the interests of statistical consistency it was decided to keep CTL in that section.

Application	Mainframes 1983 (Sample: 819)	Mainframes 1982 (Sample: 321)	Minicomputers/SBCs 1983 (Sample: 1245)	Minicomputers/SBCs 1982 (Sample: 633)
Accounting	72.7%	(78.8%)	56.8%	(72.5%)
Payroll/personnel	59.3%	(62.0%)	38.3%	(44.9%)
Order processing/inventory control	49.9%	(55.8%)	45.5%	(57.7%)
Sales/distribution	37.9%	(40.6%)	32.6%	(42.7%)
Purchasing	36.1%	(39.8%)	31.6%	(41.7%)
Manufacturing	23.6%	(28.0%)	22.0%	(24.2%)
Other	26.9%	(24.9%)	26.7%	(28.3%)
Engineering/scientific	21.4%	(23.4%)	22.0%	(13.7%)
Mathematics/statistics	21.0%	(23.4%)	17.3%	(13.1%)
Banking	21.9%	(14.3%)	9.7%	(7.4%)

Figure 5: Principal applications of users' equipment.

Manufacturer	Assembler 1983 (1982)	Basic 1983 (1982)	Cobol 1983 (1982)	Fortran 1983 (1982)	RPG 1983 (1982)	Other 1983 (1982)
Burroughs	0.0 (0.0)	0.0 (0.0)	93.6 (94.4)	0.0 (0.0)	0.0 (0.0)	6.5 (5.6)
Data General	2.3 (0.0)	27.9 (21.9)	53.5 (70.6)	9.3 (34.4)	0.0 (0.0)	7.0 (3.1)
Datapoint	16.0 (0.0)	0.0 (0.0)	10.0 (9.1)	5.0 (0.0)	0.0 (18.2)	7.0 (72.7)
DEC	4.0 (5.0)	31.4 (41.6)	4.6 (5.0)	23.1 (20.8)	0.0 (0.0)	36.9 (27.7)
GEC	0.0 (0.0)	2.6 (25.0)	5.1 (0.0)	30.8 (50.0)	0.0 (0.0)	59.0 (25.0)
Hewlett-Packard	1.7 (0.0)	5.1 (3.0)	79.7 (48.5)	1.7 (27.3)	3.4 (7.1)	11.9 (12.1)
Honeywell	2.9 (0.0)	11.8 (0.0)	52.0 (92.9)	16.7 (0.0)	3.9 (7.1)	13.7 (0.0)
IBM	0.4 (0.0)	2.6 (1.0)	8.7 (4.8)	0.9 (0.0)	85.1 (95.3)	2.2 (1.0)
ICL	12.3 (18.6)	4.3 (1.0)	62.6 (62.9)	0.5 (0.0)	9.5 (13.4)	10.9 (4.1)
Microdata	2.9 (-)	74.3 (-)	2.9 (-)	0.0 (-)	0.0 (-)	20.0 (-)
NCR	0.0 (0.0)	3.6 (0.0)	96.4 (100.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
Perkin-Elmer	20.0 (0.0)	5.0 (0.0)	30.0 (75.0)	25.0 (0.0)	0.0 (0.0)	15.0 (0.0)
Prime	7.7 (0.0)	4.6 (5.6)	15.4 (38.9)	61.5 (55.6)	0.0 (0.0)	10.8 (0.0)
Sysline	1.9 (0.0)	75.5 (88.9)	7.6 (0.0)	9.4 (0.0)	0.0 (0.0)	5.7 (11.2)
Texas Instruments	10.0 (9.1)	0.0 (0.0)	75.0 (72.7)	10.0 (0.0)	0.0 (9.1)	5.0 (9.1)
Wang	0.0 (0.0)	23.5 (0.0)	52.9 (100.0)	0.0 (0.0)	23.5 (0.0)	0.0 (0.0)
Others	11.1 (10.2)	27.8 (18.0)	27.8 (11.9)	16.7 (12.9)	0.0 (4.9)	16.7 (59.8)
Total (1245 responses)	4.81 (5.6)	16.7 (15.9)	31.2 (32.4)	13.0 (9.9)	16.1 (19.6)	18.2 (11.6)

Figure 1: Primary programming languages - minicomputers and small business systems.

Sources	Mainframes 1983 (1982)	Mainframes 1981 (1981)	Minicomputers & SBCs 1983 (1982)	Minicomputers & SBCs 1981 (1981)
In-house personnel	95.9%	(95.3%)	82.1%	(75.7%)
"Ready-made" programs from the manufacturer	50.3%	(51.4%)	42.6%	(33.6%)
Proprietary software packages	53.2%	(52.6%)	38.6%	(33.5%)
Contract programming	34.3%	(32.7%)	30.2%	(33.5%)
Manufacturer's personnel	8.7%	(9.7%)	7.0%	(7.4%)

Figure 2: Principal sources of application programs.

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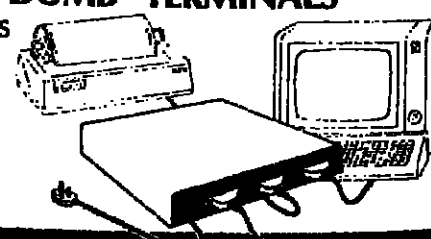
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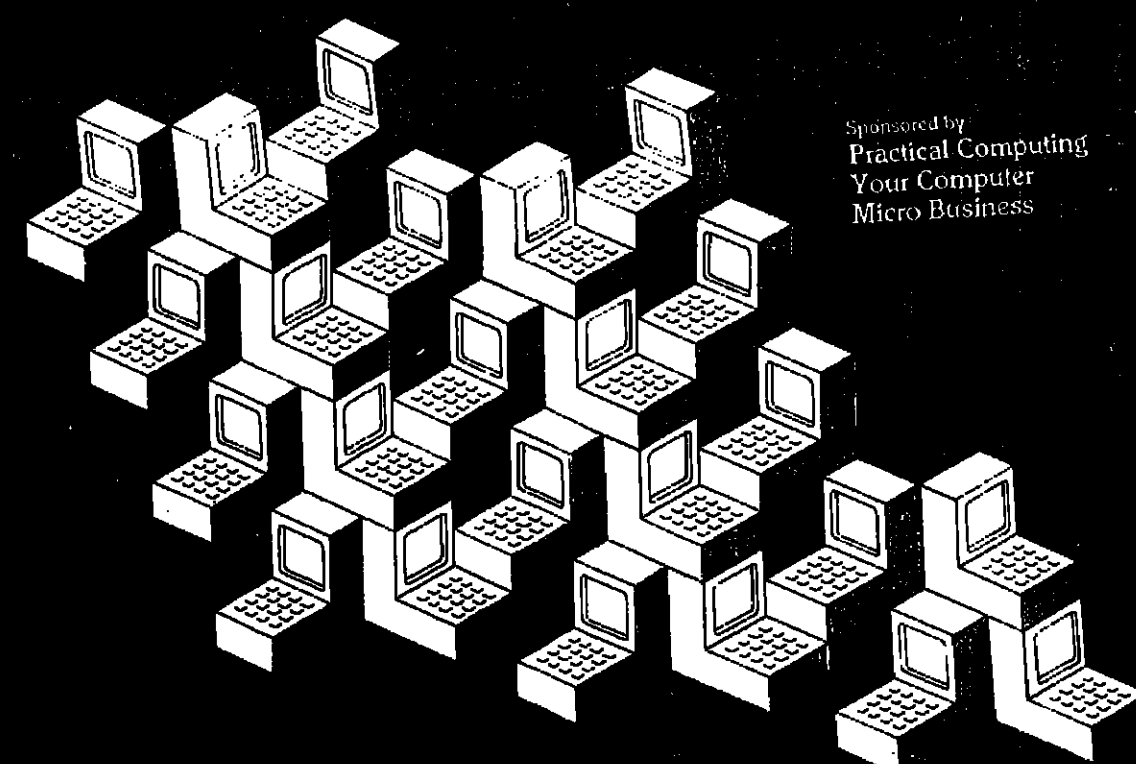
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# RESEARCH

## Down-to-earth academics tempt the purse-strings

Funding for research comes readily to those projects with commercial potential, as David Casey finds out

TO DESCRIBE a scientist as an academic a generation ago was to recognise his commitment to research in a teaching environment, free from the pressures of commercialism. In the most materialistic world of 1984, that same label is more often applied scathingly to a researcher whose activities have little prospect of commercial exploitation — a potential drain on resources which are already stretched by public spending cuts.

Central government funding currently provides 80% of finance consumed by postgraduate research in our universities. To say that the British taxpayer must see an equitable return on the invest-

ment would be to deny any broader educational role for these establishments in our society.

Political overtones apart, for Whitehall to intervene in the allocation of finance to universities would permit an unacceptable degree of state control in research. The present Secretary of State at the Department of Education and Science, Sir Keith Joseph, readily agrees that the system of funding this sector through the University Grants Committee (UGC) is the most acceptable approach. There is even a commendable degree of detachment shown by otherwise controversial local authorities, which control the bulk of finance reaching the polytechnics.

Like its paymaster, the UGC is quick to delegate responsibility for postgraduate research. It operates by grant-aiding the universities. Funds available each year seem to be allocated on a completely arbitrary basis — in practice, however, the committee claims it takes several factors into account before announcing the grant to each university.

But what those factors are, and the extent to which they influence the size of the grant, is not revealed. It is admitted that the technological requirements of each establishment have a bearing; how

far the previous track record of a university in productive research influences the committee must be a matter for conjecture.

Such circumspection on the part of a body disbursing public research funds is reasonable. Greater disclosure of the criteria could help the universities structure their programmes in applied technology to a pattern coordinated by the committee. Far from imposing authoritarian control, such an approach would ensure that research projects of national importance were funded, and that there was still a fair allocation of money for more rarified "pure" research.

With the system as it is, however, pitched battles rage within the universities for most of the academic year, while it is decided how the grants are to be divided between competing interests. In an environment where personalities have greater influence on the outcome than the merits of their case might deserve, an undue proportion of the funds available for research may be directed into strictly "academic" channels.

One factor which does not seem to have a bearing on UGC deliberations is the amount of money received each year from the specialised research councils and charitable institutions. The Science and Engineering Research Council (SERC) includes computing and its applications in its responsibilities. With a total of £200 million worth of research grants outstanding in March 1983, SERC funds research in areas as diverse as polymer engineering and aspects of archaeology.

The funds committed at that time to information technology and Alvey programme subjects stood at £26.7 million — a 13% slice of the SERC research cake.

Rather more open about its activities than the UGC, SERC states among its objectives "identifying and supporting areas of special importance, particularly where the national interest is concerned" and the training of graduates in areas of science and engineering which are of importance to British industry.

With its selection criteria drawing on these objectives, the

council recommended just over 2,100 projects in the last financial year. The support approved was £84 million; a total of 4,600 applications had been made for £228 million. Information engineering projects supported by the council took the lion's share of the funding — accounting for only 10% of the total number of grants, this sector was awarded 20% of the funds.

Compared with the total resources of SERC and its counterparts in agriculture and medicine, the ability of the charitable institutions to finance research is minuscule. But institutions like the Wolfson Foundation, with its Technology Scheme, do have an important role in higher education.

Dr Leonard Rotherham, a former vice-chancellor of Bath University, is adviser to a Wolfson trustee on grants. He explains that there is no particular bias towards computer hardware or software. "The fund covers any branch of science, provided that the research can eventually be applied to an industrial application," he says. "This definition may be widely interpreted, but at the end of the third year of a project, we would expect the research to have yielded some positive advantage."

In 1983, the trustees made a total of 19 grants from the fund — the largest was £180,000 for a materials science study — and Dr Rotherham expects around the same number to be awarded this year.

The spread of disciplines supported under the Wolfson Technology Scheme is broad, but computer-related projects have received their fair share. The University College of North Wales at Bangor, for example, was able to develop software for the optimisation of circuit design — inherently theoretical, but with direct commercial applications.

One of the organisations well placed to fund that critical stage is Investors in Industry (Ii), the new incarnation of the Finance For Industry group, which includes ICFC and is jointly owned by the Bank of England and the UK clearing banks. Its Technical Development Capital (TDC) sub-

sidary — re-styled 3i Ventures — is the arm that invests in commercially viable projects, taking them from development to production and beyond.

Since 1980, the company has been headed by Geoff Taylor, whose experience as a senior manager in US and British computer industries spans 20 years.

Taylor explains that supporting research is not a prime objective of 3i Ventures. "3i Ventures gets involved when the research has reached the stage where it needs to be developed into a product. We would not expect to start a relationship by funding research, but in any high technology operation the research has to continue in parallel with production."

Where a project has strong commercial potential at the research stage — a "seed investment", as Taylor describes it — the funding provided can be well under £100,000. "But we would not consider working on such a small scale unless there was the prospect of investing at least a quarter of a million. In all our ventures we are looking towards the longer term."

Investments are equity stakes, with the 3i operation taking a substantial minority shareholding. Taylor rejects the idea that any directors appointed are custodians of the investment. "We often take a seat on the board, but it is certainly not to control the business. We go in as a partner to contribute to the thinking — and the doing — in the venture. By hiring staff with extensive experience of business and industry for 3i Ventures, we are able to do more nurturing than monitoring."

The clearing bank parents of the 3i consortium are casting their own net over technology. Barclays, for example, has invested heavily in university projects as a commitment to "social responsibility". Research is being funded at Durham into flexible manufacturing — extending the use of robotics in manufacturing — while at Kent, money has been found for a biotechnology unit.

On the Science Park at Warwick, the bank has built a £1 million "incubator" site for small high technology companies; a venture

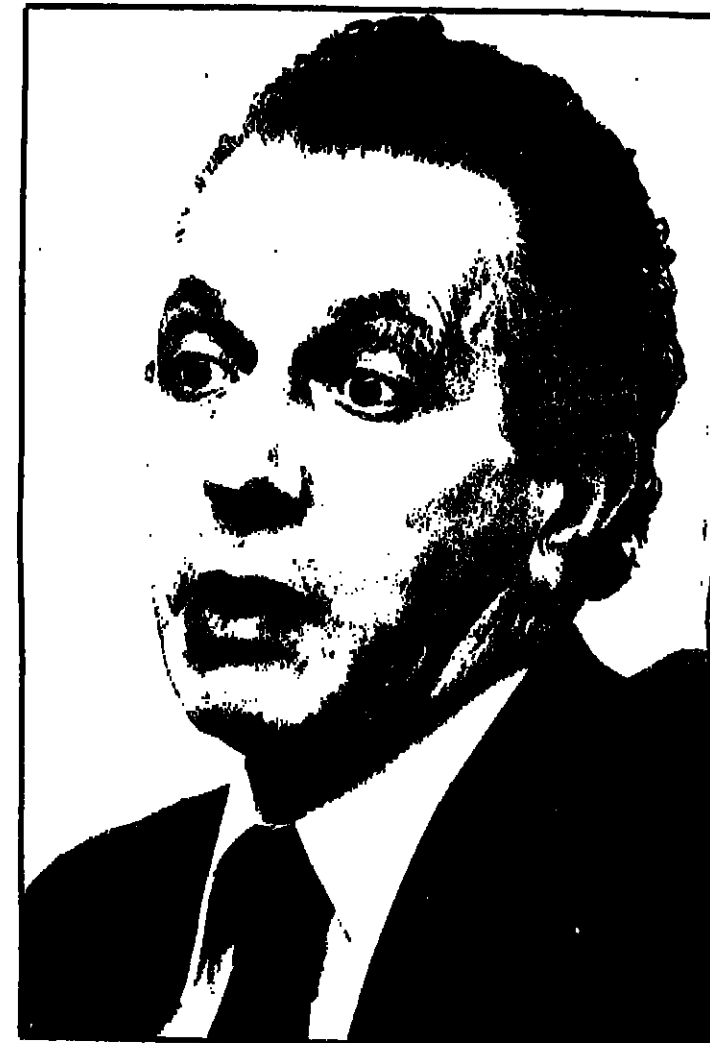
due to be opened by the Prime Minister later this month.

Perhaps the most significant of the projects funded from this source is the Barclays chair of microcomputer applications in industry at Manchester — a £250,000 endowment originally provided to finance a professorship and two research fellows.

The incumbent, Professor Frank Sumner, explains that one project had been commercialised and had helped the unit expand to 10 staff without eroding the capital of the endowment. "Yaman, a company wholly owned by the university, has a £750,000 turnover from the VuWriter scientific word processing developed here in the department."

Ian Duffell, manager of Barclays' high technology team, is encouraged by the work in the universities. But he believes that the bank should not be funding pure research in the commercial sector. "It is not what the depositors expect from a clearing bank. Our expertise lies more in providing the range of financial support beyond the research phase, with venture capital where appropriate from the merchant bank, leasing companies and the bank's development capital fund."

Duffell does not accept that Barclays is only dabbling in high technology. "Our total investment in this sector now exceeds £1 billion — as much as the bank's commit-



JOSEPH... Agrees funding through UGC is most acceptable approach.

ment to agriculture."

Developing its role as a catalyst in the funding of high technology, Barclays is sponsoring Technart at the NEC from February 21 to 25. The 120 exhibitors hope to attract visitors prepared to license developments or help their research progress to production.

One person likely to take the opportunity provided by Technart to meet the higher education sector is Dr John Waller, who co-ordinates relations between the universities and the British Technology Group. BTG, the umbrella for the old National Research and Development Corporation (NRDC) and National Enterprise Board, invests between £2 million and £3 million a year in about 100 university projects.

Dr Waller explains that, because few university staff have a background in marketing, the preferred route is to license the development to an established British company. He sees software ventures as the main exception, however. "There are many examples where academics can do very well."

And the price of BTG support? There is an equity stake of up to 25% — which the group will hope to sell at a profit in a reasonable time scale — and the assignment of patent or licensing rights to BTG.

Duffell does not accept that Barclays is only dabbling in high technology. "Our total investment in this sector now exceeds £1 billion — as much as the bank's commit-

ment to agriculture."

David Casey is a freelance journalist.

### RESEARCH

## Pinning down the airy-fairy

Man machine interface has no concrete definition or limits. Judith Morris finds out how research is dealing with it

WHEN Brian Oakley was asked about the four areas which the Alvey directorate had specified for research, he described man machine interfaces as the Cinderella of the four.

And, indeed, when compared with solid specific subjects like software engineering and VLSI, the problem of man machine interface does begin to sound a little airy-fairy.

All pervasive, covering all aspects of a company's business, spread throughout a firm's operations or a university's disciplines, requiring and touching upon diverse skills from psychology to mathematics — in fact, meaning all things to all men — the area is as difficult to define as it is to limit.

Plessey's Chris Barrow has been seconded to the Department of Trade and Industry to head the Alvey team on man machine interface. Why Barrow? His answer is that question expresses many of the problems he has to face.

"My interest was really in telecommunications," he explains, "and then I became interested in office automation, where the user interface is all-important. Man machine interface is a fairly specialised field, but it does cover a lot of skills. No one person can



Complex products are now getting into the hands of non-professionals

expect to have experience of the whole field: image processing, for example, is very different from dialogue.

"I have had a very wide experience," he adds, "which qualifies me as well as anyone to look into this problem."

So what is the problem? Immediately, it is to define the area and to try and bring the different aspects and applications of it together.

"Some of the areas mapped out for funding," says Barrow, "such as VLSI, for example, which is a very 'high profile' area — are more obvious than others."

"Man machine interface is not a high profile area, but it does cover absolutely everything we create in the information technology field. It is not easy to bring it all together."

"For example, there is no part of the university scene which covers it. The Applied Psychology Unit at Cambridge is doing work on it and computer science departments up and down the country are looking into it, but it is an interdisciplinary subject."

Because there is no university or company which has an office with the words "man machine interface" on the door, the Alvey group under Barrow's direction is having to start more or less from scratch.

At the moment, a large number of people are involved in the study at many different levels. Like the other topic areas picked out by Alvey, the directorate will be making

strategies and producing a document on the subject.

To do this, the group has had to call for help from over 200 people in industry, academia and government departments.

Three areas have already been defined: human interfaces, focussing on interactive interfaces from the human to the machine; pattern analysis, which will include image and speech processing; and some display work.

Although the document makes reference to each of these areas, it does not expand on any of them. Starting this month, a series of workshops is to take place concentrating on the different areas involving 30 to 40 experts in the relevant fields.

The five workshops, which are residential and will each last for two days, are expected to produce concrete ideas for possible areas for research. Fairly short reference will be taken, says Barrow, and they will be expanded by the specialist groups to ensure covering all areas.

When the output from the groups is assimilated, probably by the beginning of March, some clear idea of research should have emerged. But it will be a daunting task, and if the process seems cumbersome and vague, then it is because it is necessarily so — the nature of the subject being what it is, and with 200 people from widely differing backgrounds and disciplines all itching to have their say.

One reason the interface is so important is that complex products are now getting into the hands of non-professionals. The rapid increase in the number of novices using or wanting to use a computer has made it in industry's interest to perfect a product which makes that easier.

One company which is trying to do just that is Lansay, headed by Ian Litterick. With funding from the British Technology Group (BTG), Litterick has worked on a one-handed keyboard which is now at the prototype stage.

Litterick sees the product as being the basis for several ideas. "It was designed for a pocket computer with a flat fold-out screen," he says. "The brief was simply that they keyboard should be smaller in size than a paperback book, and that there should be a key for each letter like the Qwerty keyboard on a normal typewriter."

It is easy to use and simple to learn, so there are really possible areas of use — either a company could simply use it as a keyboard and integrate it into other machines, or substitute it for a normal Qwerty keyboard for desktop use, so that it takes up less space, and leaves room for a desk full of papers — making it really a tool among other tools."

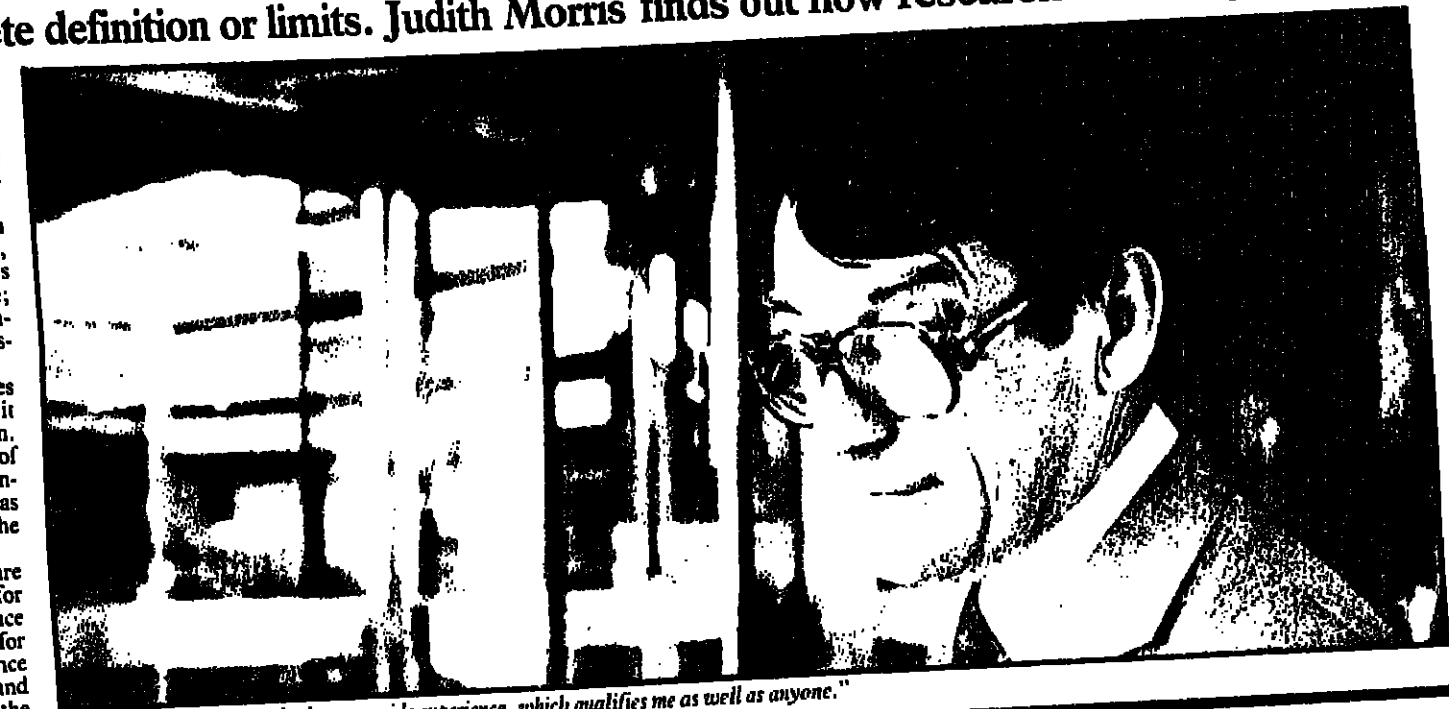
Lansay hopes to be "in close negotiations" with manufacturers over the next six months.

Other projects are more long-term. At GEC, for example, Peter Collins wears two hats in his involvement with man machine interface work.

Collins concerns himself with speech and image processing but points out that all the product units within GEC are working on more short-term projects with a view to launching products within a year or two.

Much more so than other areas mapped out for Alvey funding, the various disciplines touching on man machine interface must be laid before the Alvey directorate can proceed. In this way, the project will take longer and be more complex than probably any other begun under the present UK initiative.

Judith Morris is editor of Computer Talk.



BARROW... "I have had a very wide experience, which qualifies me as well as anyone."



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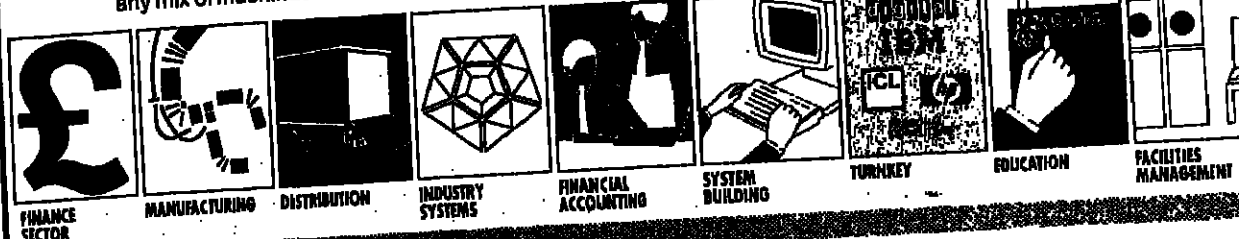
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## RESEARCH

Support for microcircuit engineering operations previously funded by SERC may be reduced, warns Hedley Voysey

# Alvey could stultify university work

ONE of the ironies surrounding the creation of the Alvey Directorate is that it may stultify some areas of work within British universities. The simple reason is that the scale of funding for Alvey schedules of work will act to reduce the level of support for university operations in microcircuit engineering that would previously have been funded by the Science and Engineering Research Council.

Tracking developments in Very Large Scale Integration (VLSI) in the UK is difficult. On the one hand, some significant developments are revealed rather belatedly so as to avoid any possible reduction in their commercial advantage.

On the other hand, there is so

much fragmentation of the UK development activity that many interesting pieces of study fail to be linked up with other work and so soon peter out in their impact.

There is also a perverse feeling of exhaustion among workers in the microcircuit engineering field. After striving to get the Alvey idea to the starting gate, it seems too much to expect an extended period of ideas to follow on immediately.

Just as the Alvey study arose from near-panic about Japanese expressions of intent, it seems that new UK ideas need prodding into circulation by US industrial achievements.

For instance, the MicroVax has emerged from Digital Equipment, and this has served to re-focus some attention in the UK on the

design methods used to create the MicroVax.

Although there is nothing very startling about the methods used, it serves to remind UK firms that Digital Equipment chose contractually to exploit the services and products of Silicon Compilers Inc. Therefore, some industrial houses have taken a renewed interest in what is available in silicon compiling services here in the UK.

"Silicon compiling" is the rather informal term used among design engineers to cover aspects of computer-aided engineering in microcircuit logic design.

By analogy with classic program compilation, the aims of a complete silicon compiler are to start with functional descriptions of what the chip is to do, and by completing all the transformations involved automatically, to arrive at the end with a physical layout for use via a particular chip-making process. This idealised view accounts for the use of the term.

In practice, silicon compilers try to use the logic design habits of earlier technologies and help in the correct design of chips. Since there is a constant need to let the designer intervene in the chip design as basic constraints on what can be done emerge, the process of using a silicon compiler is a highly interactive one.

The real achievements in this field so far have enabled designers to detach themselves from detail which distracts them when making basic design decisions. At the same time, the design aids should give opportunities for fine tuning of designs to optimise final chip performance when this is essential.

Clearly, a silicon compiler used for gate array implementations is a different animal from one dealing with putting a volume microprocessor scheme on to a chip.

Although there are few comparable design tasks awaiting completion in the UK equivalent to the one faced by Digital Equipment (in creating the MicroVax), the route taken by Digital has served notice on many UK electronics firms that products are better designed in silicon these days than on printed circuit boards.

Bill Talbot, who once headed up engineering in ICL and who now consults as Talbot Technology, believes that "if appropriate methods are used, the advantages of designing in silicon can be considerable for many major UK enterprises".

The last year has seen some favourable light shone on the work of Lattice Logic of Edinburgh, which can be regarded as originating its design system from within Edinburgh University. Lattice Logic would not claim that it had produced a silicon compiler on a grand scale, but its methods do abstract designs to a degree.

The versatility of the system has been rather fully demonstrated by adapting the whole box of tricks to work with Ferranti's gate array processes, which are not at all like the processes for which it was originally built.

David Eglin of Lattice Logic has some warm words for the Ferranti chip-making system: "It enables both analogue and digital tricks to be combined and it can provide a quick way to evolve a new product to fill a market demand from within the UK instead of relying on imports."

Eglin does not think that the Ferranti process has yet reached the end of its life by quite a fair margin.

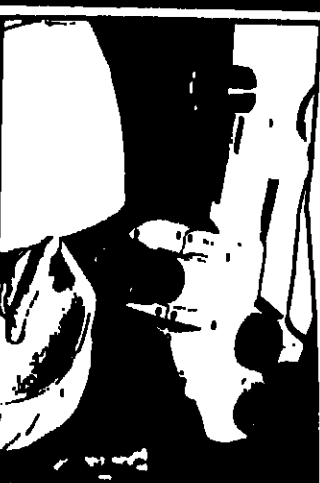
Although the whole business of gate array design is somewhat old hat, the fact remains that for many

UK firms the logic that needs about 1,000 gates fills many of the needs that are not met by very large volume standard products.

The development required is the fastest possible turnaround in prototyping the design at reasonable cost: a combination that may bore real researchers to tears, but it is hard to find today and it has significant effects on industrial competitiveness.

The splendid quality of work done at GEC is respected, but the more amazing things done with silicon-on-sapphire by GEC are mostly of use to the military for the moment. Although the same is not true of Plessey's gallop into gallium arsenide, because it has large scale potential in fibre-optic based digital transmission circuits and satellite communications systems, the fact remains that the media attention on the topic is unrelated to most industrial criteria.

Innos suffers in the same way because its achievements are not exotic enough for the media. The achievement is worthy of note. It is a silicon house that has made the transition to complementary metal



Taking the whole span of work in the US into consideration, it leaves the impression that a fundamental change is taking place in design habits. As yet this is simply not true in the UK

oxide silicon (CMOS) using a process which is akin to the Bell Laboratory development.

It is fairly obvious that Innos cannot turn itself into a jobbing house to serve the custom design needs of the UK. However, it has plans to exploit its trendy design system to carry out semi-custom designs where volume is large.

The design goodies produced via the Innos team may be just what the Alvey Directorate section working in VLSI under Dr Bill Fawcett is looking for, in at least some part of the project.

If the VLSI project is to have any meaning, there will need to be a breadth about its design systems, because what is needed to produce special signal processing answers in VLSI is not necessarily a design system which serves some other set of digital functions. There is still a need to blend the analogue and digital pieces of designs.

Real advances in silicon compiling methods are being made in our universities, but it is doubtful if these will be coerced in time to transform the design practices of most of the middle rank firms to beat overseas competition.

This research feature is continued on page 35.

120,139 ABC JULY-DEC 1983.  
129,335 SINGLE ISSUE AUDIT NOV 10th 1983.

PUBLICATION	CIRCULATION	SOURCE
Computer News	100,000	Computer News
Computer Weekly	97,226	ABC 1982 (last published figure)
Computing	110,920 124,635	ABC June Dec '83 Spot Check 15th Dec '83

JULY

## What a source!

You know what they say. About there being lies, damned lies and statistics?

Well fortunately, there are ABC figures as well. And they are in black and white for anyone to check on. (At least, they are for all the publications that matter.)

So remember, although there are quite a few publications that claim to reach computer professionals, it pays to check their sources.

### computing

The industry's most widely read weekly.

# Yes. What a sauce!

We hope this advertisement will set the record straight, once and for all. Computer Weekly's ABC figure for July-December 1983 is 120,139 while Computing's ABC figure, over the same six month period, and not June-December as they have mistakenly quoted, is only 110,920.

What makes us even more confident that our figures are more accurate is the fact that each Computer Weekly reader is verified every 12 months, unlike our competitors who wait 3 years.

In addition, our circulation is updated with newcomers to the market from unique applications at Computer Weekly's own shows: COMPEC and the regional COMPECS.

So, to summarise, Computer Weekly has always been the best read journal in the business for reaching key job-hunters and purchasing decision makers at all levels.

And still is.

## Computer Weekly

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For more Marketplace Advertising, please turn to Pages 32, 33 and 34.

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The Council wish to evaluate prospective suppliers of computer systems able to provide comprehensive information, storage and retrieval facilities, inter-office communications and word processing, proprietary to issuing an invitation to selective companies. Invitations are extended to major computer manufacturers able to provide such a system to express their interest in being invited to tender for the supply of such a system. Please reply giving details of the company, any relevant experience and product information to the Town Clerk, Langbaugh Borough Council, Langbaugh Town Hall, Fabian Road, South Bank, Middlesbrough, Cleveland TS6 9AR.

The closing date for the receipt of expressions of interest in being included on a selected tender list is Monday, 14th February, 1984.

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PAGES 42-79**

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## JOBS IN SALES AND MARKETING

A technical bent is a plus for those looking for a position . . . Steven Sonsino looks at the state of the market

# Find how it works before trying to sell



"Moog is so excited. He's just discovered packaging."

TIME marketing and selling of computer equipment appears to present no problem in job creation. As with most areas of the industry there is a shortage of good skilled people.

Some areas, like selling peripherals, are so cut and thrust that huge sums have to be spent to push "name" products; so sales and marketing workforces are usually quite large here.

Traditionally, sales positions have been the less well paid of the two jobs, but there are perks, usually including company car, and sometimes substantial bonuses.

Marketing posts in many cases have become extremely creative, and some companies involve marketing personnel in designing products as well as in promoting them.

There are many routes into sales and marketing, not least from engineering or technical backgrounds. Sales staff who know how products work (and can show customers how they work) are valuable contacts for the customer — and quite valuable to a company, too.

It can also pay to be technically minded in marketing positions. Knowing the good and bad points of products is the first step towards knowing how to promote them.

As for marketing jobs in the computer industry, "the world's your oyster," says one marketing executive. "Computers are being used in every avenue of life and new markets are being developed everywhere."

The world needs an endless supply of people who understand the capabilities and failings of computers to sell and market them.

Within the peripheral business, marketing becomes a little more difficult, says Phil Mobbs, a marketing manager for Dataproducts in the UK. "You're marketing to the industry, not to the whole world," he says, and it can be difficult to organise volume shipments.

"In our company, we like sales and marketing people to be adaptable. We also like them to understand the history of the particular part of the industry they deal with," is his comment.

"Because the company is still

fairly small in the UK, we need people with a little experience. We don't really have the facilities for training of the ICs and DEC's."

For smaller companies the computer industry is a "dogfight", he adds. "It's the survival of the fittest."

There is hope, though, for graduates and YOP scheme youngsters, says Mobbs. "Training schemes operate within most of the big companies, and failing that there is always the micro business."

Micros are fairly easy to under-

stand for students because of their college or school training and the widespread use of the home computer.

There is a 17-year-old in the south-east who, for a price, installs home computers and explains to parents and children alike how to use them. He will explain the documentation that comes with the computers and answer any questions a family might have, as well as suggesting applications that no one in the family may have thought of.

The bottom end of the computer market is a bit like the hi-fi market. Some users are now becoming so knowledgeable that they can buy the right equipment for a system, thus no longer needing an OEM or systems integrator.

The user will "buy all the bits and bolt them together," as one marketing director puts it.

These kinds of people are identifying a niche and filling it to the best of their abilities. And it is these people who will become the sales and marketing managers of the future.

Trying to market printers is difficult, said a spokesman for Anadex, although printer sales increased overall in 1983. The problem is that not many people take an interest in individual peripherals and sales or marketing pitches can often be wasted on the potential buyer.

Where sales were once made to

data processing managers, who knew a company's output requirements, most volume printer sales are now made to system dealers. The dealers then package the printer with a keyboard and terminal for the business systems market. The printer does, of course, have a different name on the front.

"This makes sales and marketing jobs much harder," he says. One answer is to improve the products.

Another is to cut prices. Anadex has done both, increasing the speed of its printheads by 20% and cutting the prices of all its printers by a similar figure.

According to Gianluigi Bertino, OEM sales manager for Olivetti Peripherals Equipment, a college or university education cannot do too much for individuals who want to get into sales or marketing of OEM products. There are, however, "lots of opportunities within micro-associated industries for people who want this kind of job."

Olivetti takes on graduates for marketing and sales. "They become involved in project planning from a very early stage — this is a most important part of any operation," he says.

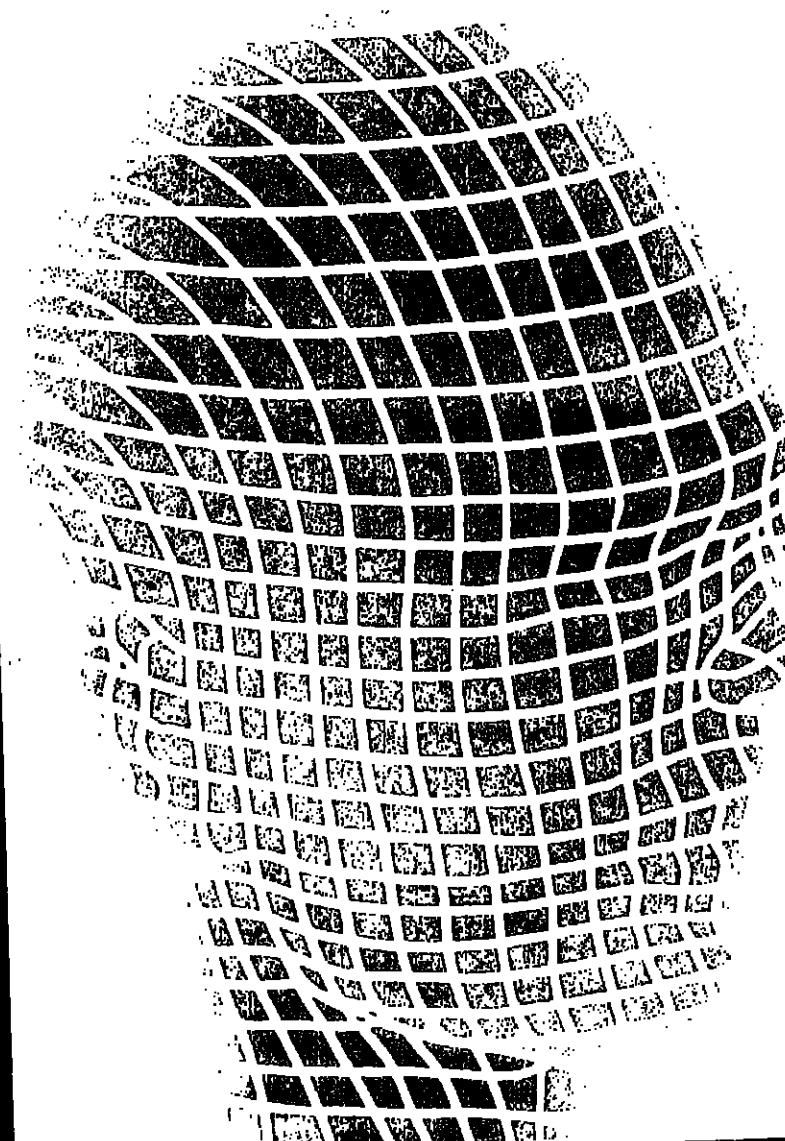
Marketing personnel take part in product launches within Olivetti, then following the success or otherwise of the launch they organise and launch further new products based on the results.

"In the industry as a whole, there are plenty of opportunities for people wanting to work in sales and marketing," says Bertino. "About 15% of Olivetti's resources are spent on sales and marketing — it's that important."

Mobbs adds: "There are all kinds of new directions that sales and marketing posts can take. New areas are developing all the time and these will require new people to take them up, with new ideas."

Steven Sonsino is features editor of Systems International.

## JOBS IN SALES AND MARKETING



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## SALES '84

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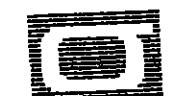
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DD11-AD	DC211-C	KEF11-BB	LP32	RM11/2		LA12	
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## RESEARCH

# Alvey starts the productivity flood

John Lamb describes one of Alvey's key areas - software engineering

THE first time most people in this business heard of the term software engineering was when it popped up as one of the four key areas of research in the Alvey programme. Since then, no self-respecting software company has been able to do without some mechanical aid to programming. But like so many things in computing, there is little that is new in the idea of software engineering. It is all about improving speed with which systems are produced and quality of the final product.

"As far as I am concerned software engineering means doing things properly," says John Parker, principal consultant at Imperial Software Technology. "In the past, we have intended to de-

structured programming, have been around for some time. Others, like the Vienna Definition Methodology are less well known.

"It's a matter of understanding how the software development process works, and producing formal rules," says Parker.

One of the latest concepts is that of prototyping. Prototyping is an attempt to make sure that whatever designed technique is used in building a system, the design process is flexible enough to take account of changes in the original problem. It involves building little models or or incomplete versions of a system which end-users can experiment with.

"The benefits of some systems are inherently difficult to visualise," says James Johnson of Hallmark Cards Inc, who is an expert on data processing productivity.

"Assume, for example, that a manufacturing plant has a batch scheduling system and that a project team is asked to determine the feasibility of a real time system.

"In a feasibility study, it is almost impossible to define how a totally different method of operation will affect an entire plant. In this situation, the best way to understand the consequences is to observe a system in operation by implementing a working model."

Johnson points out that unlike existing methods of building a system, which attempt to produce a feasible system first time, prototyping is trial and error, with lessons learnt along the way being built into the final version.

Along with these new approaches to producing programs go new programming tools: fourth generation languages, data dictionaries, relational databases, application generators, development systems and so on.

In fact, there is such a plethora of systems that users are confused about how to employ them. One M129 user reports that although he has a data dictionary system supplied with his machine, he has yet to use it because he cannot spare anyone for the time it would take to master it.

Another user, Rob Herson of Massey Ferguson, complains that there are not enough general purpose tools. "Not all these tools are what they are cracked up to be."

"Each one tends only to cover 20% of the ground you want to cover," Massey Ferguson is looking for a set of integrated productivity systems.

It has certainly taken time for many of these software tools to reach users. Mapper, Sperry's integrated database which enables end-users to construct their own small programs, has been kicking around for 10 years, but it is only in the last two years or so that it has found success.

Investment in productivity tools has been very low indeed. "If you have been very low indeed," says Parker. "If you compare the way programmers use source editors, which the facilities available on a word processor, you wonder why those facilities aren't available to programmers," says Parker.

Part of the reason is undoubtedly the cost of such refinements. Mapper 10, for example, will set a user back £134,000, although price cuts are promised.

Sperry claims that Mapper 10, primarily an end-user tool, cuts development time by as much as one tenth for certain applications, compared with producing Cobol code. The screen formatter alone halves the time it takes to produce screens, says the company.

Despite such impressive statistics, software engineering is really

in its infancy. The Alvey Directorate believes there is a "critical need to move from the present ad hoc 'craft' practices of software production to a position which ensures that UK management turns increasingly to capital intensive methods of efficient software production and an engineered approach to reliability."

Over the next five years, the Alvey Directorate's software engineering programme will be spending some £38 million of government money, matched by £27 million from private sources. The aim of this effort is not only to develop tools and methods for producing software, but also to make sure that managers regard using them as normal practice.

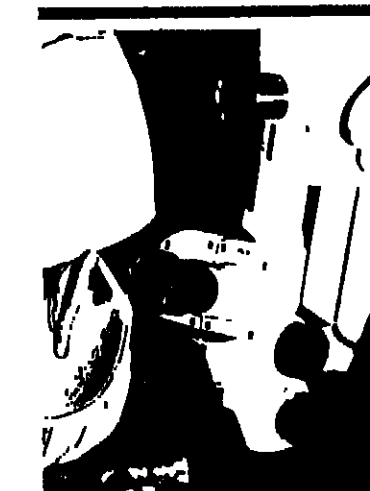
The key development in the

programme will be the production of an integrated project support environment (IPSE) in which tools and methods exist for the specification, design, programming, building and testing of a system throughout its life cycle.

The Alvey Directorate also believes that there are enough similarities between the hardware and software design processes to be able to combine the two in something that is called the information systems factory.

There is little doubt that software engineering offers solutions to many of the deep rooted problems of software production. What must people involved in selling and buying productivity aids prefer not to talk about is their impact on programmers themselves.

WILMOT... Claims users have a backlog of applications development.



"As far as I'm concerned, software engineering means doing things properly"

velop software by the seat of our pants; software engineering is a recognition of the fact that a lot of the work involved in building software is repetitive.

"What one hopes is that the software industry will adopt a similar approach to civil engineering, in which there are well recognised methods of doing things, and so improve software productivity and quality."

There are certainly good reasons for improving the way in which software is produced. A survey of user expenditure carried out by Computer Weekly in conjunction with IDC Europe and published in September 1983, revealed that data processing staff accounted for 41% of the total spent on computing, amounting to about £2,641 million in 1982. This figure compares with the £2,020 million spent on hardware and £977 million that went towards buying software and computer services.

Robb Wilmot, managing director of ICL, claims that many users have a backlog of applications development that will take them three years to clear.

"Our group strategy is to offer high value solutions to high volume problems," he says. ICL, like many other firms, sees a ready market for any product which can either speed up the production of applications or allow end-users to adapt existing systems.

But what exactly is software engineering? According to Parker, it is a collection of methodologies and tools which help in the administration, production and testing of a software system.

Researchers have attempted to draw up procedures or methodologies which will guide designers and programmers in a formal way. Some of these procedures, like



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Telephone: \_\_\_\_\_

Bell Telephone Manufacturing Company  
A Belgian company associated with ITT

**ITT**

RESEARCH

# The Transputer is at the crossroads

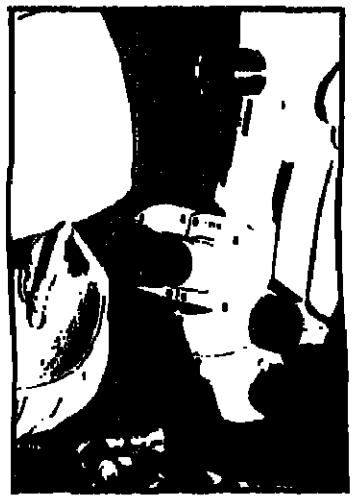
Martin Banks queries government support of the Inmos Transputer

THE English have the reputation of supporting financially technological white elephants while buying in from abroad lots of Trojan horses. It isn't always true, but the reputation tends to stick.

As a race, we also have the reputation of thinking up new ideas for technological Trojan horses, giving them away and then letting the recipients practise on us.

Again, it isn't always true, but it is a reputation that rings true. The latest vehicle for such speculation - white elephant or give-away Trojan horse - is the Transputer from Iann Barron's Inmos. This insignificant looking device has been bedded in its silicon not only the active elements of an entirely different approach to designing computers, but also the seeds of classic English technical dilemmas.

Should government departments provide the money to make such a device, given that its



It has the potential to make or break

support record has tended to be one of the key factors in creating the stated reputation, or should it let the company, and thus the product, go to the highest bidder out there in the commercial world.

The former route carries with it the potential political kudos that it would be the government which had the foresight and courage to grab a major opportunity to create the product of the future.

By the same token, it also carries the potential political minefield of having once again supported a profligate waste of national resources to no good purpose.

Not surprisingly, the second route carries with it the opposite potential. Sell to the highest bidder and the kudos of being a government sharp cookie is there to be had. There is, however, the risk that the buyer will sink just that bit more money into the product - money that had been asked for all along - make it work, and sell it back to us at vast profit.

Having been born of politics as much as any technical or financial consideration, it is probably only fair that Inmos should continue to be obliged to conduct its affairs in the glare of the political spotlight.

It could be a financial sponge for some time to come. The question, politically, is whether Inmos will become a financial black hole and, if not, when not.

There are reasonable technical arguments which indicate that the company will not in practice become a black hole. There are also reasonable marketing arguments. These are, however, set somewhere out in the near future.

When it started out, Inmos got saddled with being the world progenitor of the wonder chip -

the 64K RAM - by an untutored national press. That same press then discovered that every other semiconductor manufacturing company in the world worth its diffusion furnaces was doing exactly the same thing. There was a quick volte face and the press called it all a con.

In practice, the 64K RAM was a part that, though it was hoped might make a profit in its own right, was something of a loss-leader to get a process going.

A semiconductor company needs a workforce and production plant that is working well if new circuits are to be produced, and easily categorised devices such as random access memories are helpful in this process.

In the end analysis however, Inmos is about the Transputer more than any other component it has so far designed or built. This device has the potential not only to make or break the company, it has the potential to make or break some big industry names.

Why this should be so is a function both of the device itself, and the direction in which computer technology per se is moving. It is possible to see that the two, the device and technology generally, are moving together with a certain degree of inevitability.

Taking the technology of computing first, there is the ever-present push from the users for more power, more speed, more flexibility.

One of the key requirements now is operational flexibility. Brute power is not forgotten, but today it must be flexible in its utilisation.

Because there is but a single processor inside the classic Von Neumann machine, it follows that only one task can be done at any time. Much effort has been put, therefore, into trying to develop bigger, faster and/or more powerful central processing engines with which to power computers.

No matter how powerful a single processor may be, however, it still ultimately restricts operations. Faster operation of the processor can give smaller periods in which to divide up a greater number of separate functions in a fantasy of apparent concurrent flexibility.

The way out of this particular bottleneck is, in practice, to find a new way to make the container. In terms of computer design, that means parallel processing, and the more parallel the better.

The Transputer combines a level of processing power that will be respectable in any form of computer together with a comprehensive range of internal and external communications capabilities.

All are tied together under the umbrella of a language and operating system that has been designed from the outset to work with truly concurrent processor operations.

Two devices are planned so far, though Inmos states that compatibility with future processors of virtually any type has been catered for. The first to appear will be the IMS T424, which will feature a 32-bit processor coupled to an on-board 4 Kbyte capacity of static random access memory and built-in support for multi-tasking operations, concurrency and communications. This is expected to be followed in 1985 by a 16-bit version, the IMS T222.

Fabricated using a combination of NMOS processing for the logic and CMOS for the memory, the device will hold the equivalent of 250,000 active components. With a cycle time of around 50 nanoseconds, the Transputer should be able to run at some five nips all by

itself, let alone in a parallel configuration.

The instructions represent a fundamental aspect of the differences between the Transputer and other micros. The instruction set resembles a Reduced Instruction Set Computer (RISC) in that it is lean and tightly encoded, both of which make for fast operation.

Another key element in the design of the device is the inclusion of on-board memory. Though this is an obvious way of making use of the capabilities of semiconductor technology - design it in because it's available - on-board memory does offer programmers a wide range of new systems design options.

With its facilities, the Transputer provides the tools for

re-linking the fundamentals of computer design. Instead of being dependent upon the Von Neumann architecture, which is single-processor in style, it becomes possible to think in terms of dividing operations and processes up between processor devices as required.

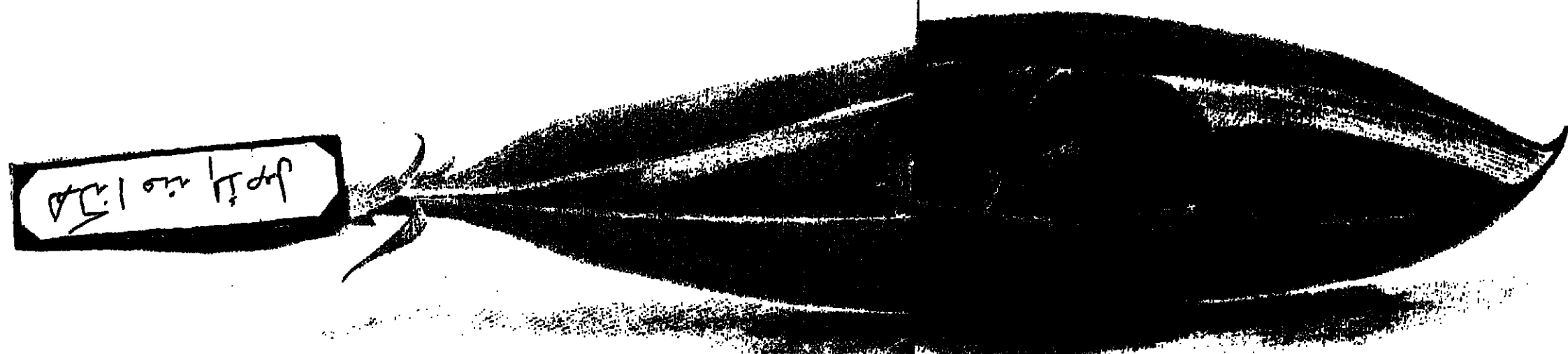
Within reason, the same hardware configuration can act as a high-powered number cruncher and data file manipulator, with selection made under software control, not hardware re-design.

With the Japanese already working hard to develop fifth generation computers that will incorporate large amounts of artificial intelligence, the availability of a device like the Transputer would seem to be fairly critical.



BARRON... Has he a white elephant on his hands?

# How close to the PC must you get to make money?



You don't have to deal with IBM to cash in on the PC boom.

But you do need a computer that's operationally compatible.

A computer that allows you to benefit from all the software and peripherals that have been developed for use with the IBM PC and XT.

Happily, the new XTRA from STC fits the bill without matching the invoice.

The XTRA has been developed by ITT, the world leaders in IBM plus compatible workstations.

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If you're interested in becoming an XTRA dealer and you'd like to hear all about STC's generous XtraCash package, phone us and ask for XTRA.

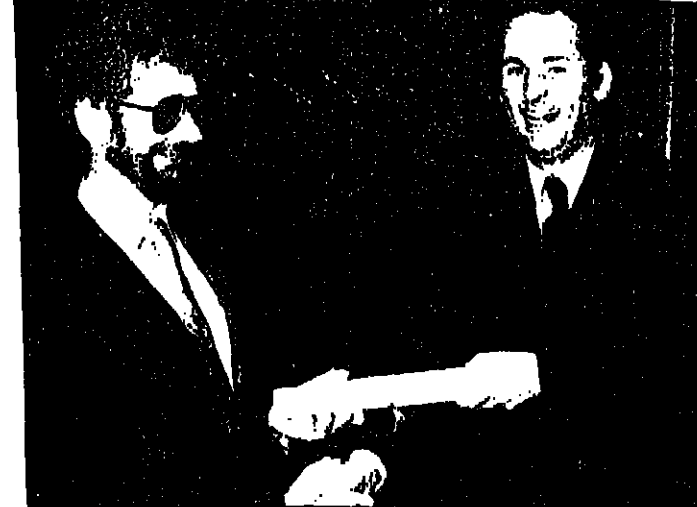
## XTRA

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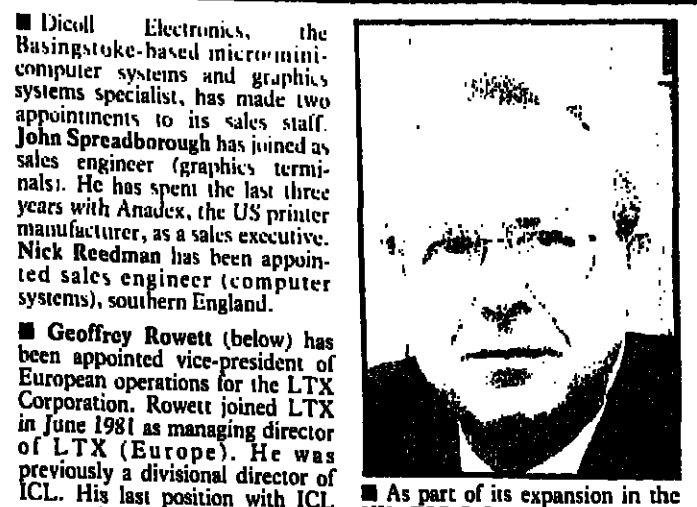
PEOPLE



Back in October Neil Hall (left) a senior support analyst at GEC Computers of Borehamwood, broke the world record for inshore circuit racing over the "flying kilometre" on Lake Windermere. Battering his 1982 record-breaking achievement, Hall averaged 70.95 mph on the required two runs in his Class T-1 craft, "GEC Computers". At this year's International Boat Show Hall received a certificate marking his feat from Richard Noble, the world land speed record holder.

Robert Harvey has been appointed senior sales consultant at CCS, a Cleckheaton, West Yorkshire, company offering services based on mainframe and microcomputers, particularly for stock and production control applications. Before joining CCS he was responsible for national computer hardware accounts as part of the Leeds-based NCR sales team; and was the Stockton branch manager of United Computing for five years.

Data General announces the election of Hisashi Tomino as a vice-president of the company. He is president of Data General's Japanese subsidiary, Nippon-Data General.



As part of its expansion in the UK, ESC Software has appointed Peter Fryke (above) as general manager. Previously he was European vice-president responsible for establishing UCC software products in Europe.

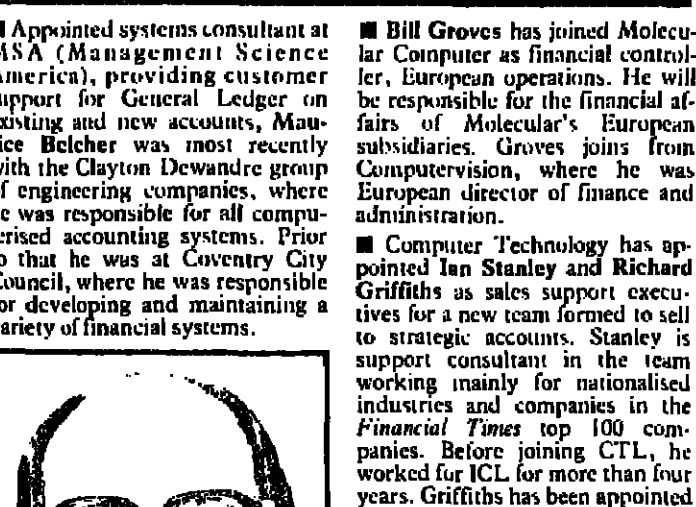
Bill Keen has moved from CPU where he was terminal sales manager, to become Southern area terminal sales manager with Melordata. Tom Cook, appointed Melordata's Southern area printer sales manager, was formerly with X Data as a sales executive. Another newcomer to Melordata is Vic Podmore also from CPU. He joins the company as a sales executive for the maintenance department.

Appointed systems consultant at MSA (Management Science America), providing customer support for General Ledger on existing and new accounts, Maurice Belcher was most recently with the Clayton Dewandre group of engineering companies, where he was responsible for all computerised accounting systems. Prior to that he was at Coventry City Council, where he was responsible for developing and maintaining a variety of financial systems.

Computer Technology has appointed Ian Stanley and Richard Griffiths as sales support executives for a new team formed to sell to strategic accounts. Stanley is support consultant in the team working mainly for nationalised industries and companies in the Financial Times top 100 companies. Before joining CTL, he worked for ICL for more than four years. Griffiths has been appointed support executive in the team involved primarily in pre-sales support roles. He was previously an application consultant for Tymshare UK.

David Parsonage has been appointed manager, UK field marketing operations, at Rediffusion Computers. He joined the company in 1977 as territory manager for the Western region and his last appointment was product marketing manager in 1982.

Peachtree has appointed Catherine Cornwell as product manager, responsible for office productivity products. She was previously senior technical adviser at Incostron/Loneywell.



The Gavilan Computer Corporation has appointed Colin Cook (above) as its European general manager. He was previously European marketing director of Storage Technology.

Alfred Mulenga, deputy DP manager of the Zambia State Insurance Company, receives his membership certificate of the Institute of Data Processing Management from IDPM secretary-general, Ted Cluff. Mulenga spent 12 weeks in England during which he completed a Fellowship in Computer Management with Computech in London and was also awarded the NCC Certificate in Systems Analysis.

Mulenga is also a founder member of the Zambia Computer Society which has a membership of about 1,000 people.



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### DIARY

**FEBRUARY 2**  
Private Viewdata: Achieving Business Benefits Today, BIS Applied Systems conference, Lord's Banqueting Centre, London NW8, £140. Details: 01-261 9237.

**FEBRUARY 2-3**  
Implementation Strategies for Factory of the Future, conference sponsored by Technology Transfer Society, Royal Aeronautical Society Lecture Theatre, London, £300-345. Details: 01-242 4045.

**FEBRUARY 5-7**  
VS APL Fundamentals, Cocking & Drury course, London W1, £300. Also February 21-23. Details: 01-493 6172.

**FEBRUARY 5-9**  
Education: Arabia and the Middle East Business Equipment, Communications and Computer Show, Bahrain, run by Overseas Exhibition Services. Details: 01-486 1951.

**FEBRUARY 6-7**  
Business Modelling with Mini and Microcomputers, course by FCB Department of Institute for Chartered Accountants of Scotland, Tree Tops Hotel, Aberdeen £235.25-379.50. Details: (031) 225 5673.

**FEBRUARY 7**  
Introduction to Unix, Bleasdale Computer Systems course, London. Other courses in February-March. Details: 01-828 6661.

**FEBRUARY 7**  
Expert System for Organic Synthesis Planning, BCS Expert Systems Group talk, University College London. Details: 01-637 0471.

**Data Privacy and Freedom of Information**, BCS Hampshire talk, Stanmore Hotel, Winchester. Details: 01-637 0471.

**My Computer and Other Pets**, BCS London (North West) talk by Heinz Wolff of Brunel University. Details and tickets: Dr L. R. Neal, Uxbridge 37188.

**FEBRUARY 7-8**  
Electronic Point of Sale - Designing the Right System for your Business, Spectra Services seminar, Hurst, Berks. Details: (0734) 345585.

**FEBRUARY 8**  
Electronic Offices, Institution of Electrical and Electronics Incorporated Engineers talk, Tollgate Moat House, Gravesend, Kent. Details: 01-836 3357.

**Plastic Cards with Intelligence**, BCS talk, Strathallen Hotel, Birmingham. Details: 01-637 0471.

**The Impact of Computers on a Small Business**, BCS Chester & North Wales talk, Theatre Clwyd, Mold. Details: 01-637 0471.

**Future of the Alvey Programme**, BCS Kingston talk by Alvey director Brian Oakley, Kingston Polytechnic. Details: 01-637 0471.

**User Experience of Structured Design Methodology**, BCS Newcastle talk, Newcastle Polytechnic. Details: 01-636 0471.

**Short papers evening**, BCS North Staffs, North Staffs Polytechnic. Details: 01-637 0471.

**Query Languages**, BCS South Essex talk, West Cliff Hotel, Westcliff-on-Sea. Details: 01-637 0471.

**Distributed Data Processing in an Open Systems Environment**, BCS Sussex talk, Brighton. Details: 01-637 0471.

**Prolog - a Fifth Generation Computer Language**, BCS Teesside & District talk, Middlesbrough. Details: 01-637 0471.



# All you need to know about synch and asynch operation

First Jennings, of software and systems house Data Logic, has prepared a series of reports on networks - called Jenseets - and the eighth of these is on communications protocols. The two space restrictions are: printing it in fine print, of which this is the second.

WITH asynchronous operation each character sent/received over an asynchronous modem link at 300 bps - 1,200 bps or over an in-house link at 300 bps - 9,600 bps is 10 bits long:  
One start bit=0  
Seven bits of ASCII code  
One parity bit (VRC)  
One stop bit=1  
The start/stop bits which frame each asynchronous character are



used to start and stop the operation of the receiving device. The time between consecutive asynchronous characters can be any value between zero and the specified value of the inter-character time-out period.

Time-outs are an important aspect of line protocols. For example, one use of a time-out is to provide a software terminating condition to an unsuccessful or incomplete "Read" operation on a communications line.

With synchronous operation, each character sent/received over a synchronous link at 2,400 bps - 9,600 bps is normally eight bits long (seven bits ASCII plus parity bit or eight bits EBCDIC). The

time between consecutive synchronous characters sent as one transmission sequence must be zero.

When synchronous operation is used in conjunction with a control character orientated protocol then each transmitted character sequence (data block or response) must be headed by a number of SYN characters.

The number of SYN characters prefixing each sequence varies with different protocols and different types of communications link (switched line or leased line). A general rule is to assume a maximum of four SYN characters per transmitted character sequence.

SYN characters are used by the receiving device for character synchronisation purposes. For a receiving device to become character synchronised it must detect two consecutive SYN characters in the received serial character stream. Once synchronised, the remainder of the serial stream is divided into eight-bit quantities and handled as characters. Any SYN characters found after that are discarded.

SYN characters are often found within the data in a data block and these are normally the result of a SYN FILL operation by the transmitting device. SYN FILL is a facility normally built into the transmission hardware of a Synchronous Communications Interface (SCI). If a computer which is controlling its SCI should fail to provide the next character of a transmission sequence in good time, then the SCI will automatically transmit SYN characters to maintain character synchronisation until the next character is provided.

Manufacturers call this a computer UNDERRUN condition.

On the receiving side there is a reverse situation to this called a computer OVERRUN condition. This occurs when a computer cannot accept all the data in a received data sequence from its SCI because of receive buffer allocation problems. Most SCIs detect this OVERRUN condition and inform the computer via status information. In many cases the recovery from an OVERRUN condition is to request the data again by

sending a NAK.

Excessive UNDERRUN and OVERRUN conditions normally point to an overloaded computer system or poor system design.

The main reason for introducing the subject of asynchronous and synchronous operation is to explain that some control character orientated protocols operate equally well with asynchronous or synchronous operation using the same character sequences.

For such a protocol the only difference apart from the number of bits per serial character (10 or eight) is that with synchronous operation each transmitted sequence is preceded by SYN characters.

For bit-orientated synchronous protocols (eg HDLC, SDLC) the beginning and end of each transmitted sequence (frame) are

marked by one eight-bit FLAG character (binary 01111100). SYN characters and Control characters are not used and data transmission is normally a five character sequence (SYN, SYN, SYN, SYN, ENQ). After sending a "bid" a device waits for an acknowledgment (SYN, SYN, SYN, SYN, "ACK") from the other end which indicates that the "bid" is successful and that the device can proceed to send its data.

If a device does not receive an acknowledgment to its "bid" after a given time-out period then the device sends its "bid" again. If two devices on the same link make a simultaneous "bid" then each device will ignore the other's "bid" because with a half-duplex protocol a device is either sending or receiving.

To overcome this problem, devices on each end of a communications link have different time-out periods, so that in the case of simultaneous "bidding" one device will eventually win.

A device which has its "bid" acknowledged will start to transmit its data in blocks. Each individual block will be acknowledged (ACKed) or NAKed by the receiving device, and NAKed blocks will be retransmitted.

Depending on the protocol an ACK can be a single ASCII ACK control character. The control character used to terminate the data section of a transmitted block is normally an ETB except for the final data block where an EOT is normally used. When a sending device has sent all of its data blocks then it sends an "End of Transmission" sequence (SYN, SYN, SYN, SYN, EOT).

The Centre combines software and HELP and UNDO mechanisms. Pressing the HELP key provides additional information on how to use the part of the centre you are working with.

UNDO allows you to correct your corrections - by pressing the UNDO key the typist can change back the last change made and this process can be continued right back to the beginning if required.

Development was based on producing a printer that was modular and robust in design, making it easy to manufacture and maintain. A quality assurance program is included in the manufacturing process and stringent environmental and reliability tests are carried out to ensure that high

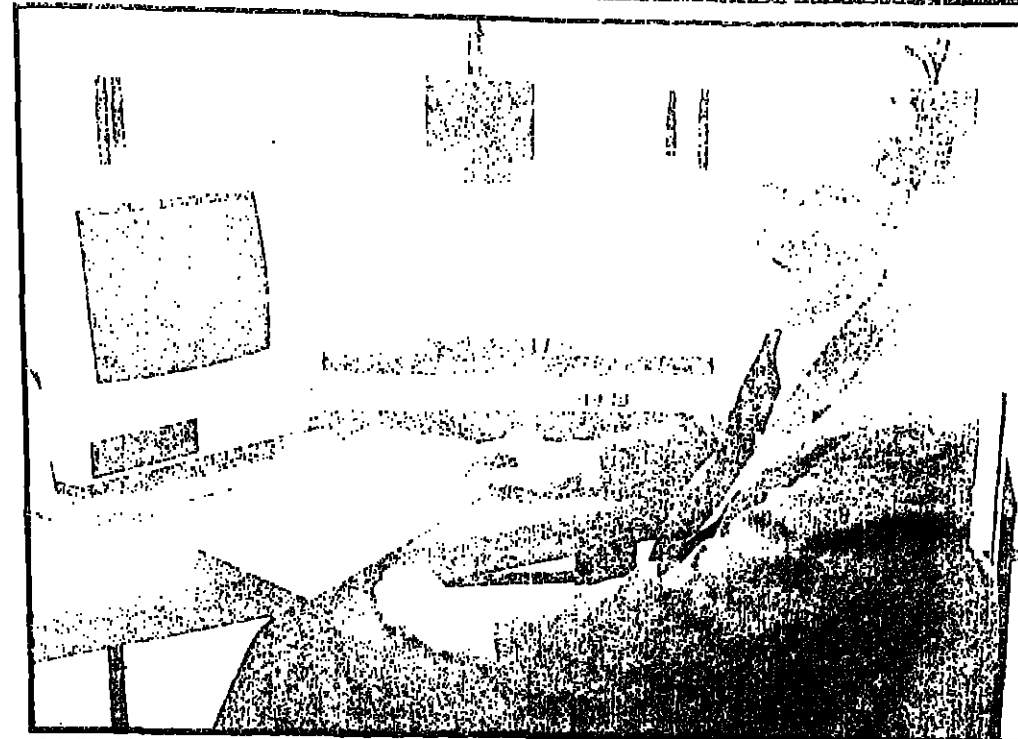
## PRODUCTS

### Personal touch in typing centre

THE new Panorama Personal Typing Centre's basic system consists of an 8088 processor, 14-inch screen, separate keyboard, integral software, one 5 1/4-inch single sided double density floppy disc drive and a 20 characters per second daisywheel printer.

The 14-inch adjustable screen shows 25 lines of 80 characters. The screen guides the operator with messages, and the moveable keyboard contains a row of labelled function keys with commands like BOLD and UNDERLINE thus avoiding complicated code keys and sequences that can make some electronic typewriters difficult to use.

The Centre combines software and HELP and UNDO mechanisms. Pressing the HELP key provides additional information on how to use the part of the centre you are working with.

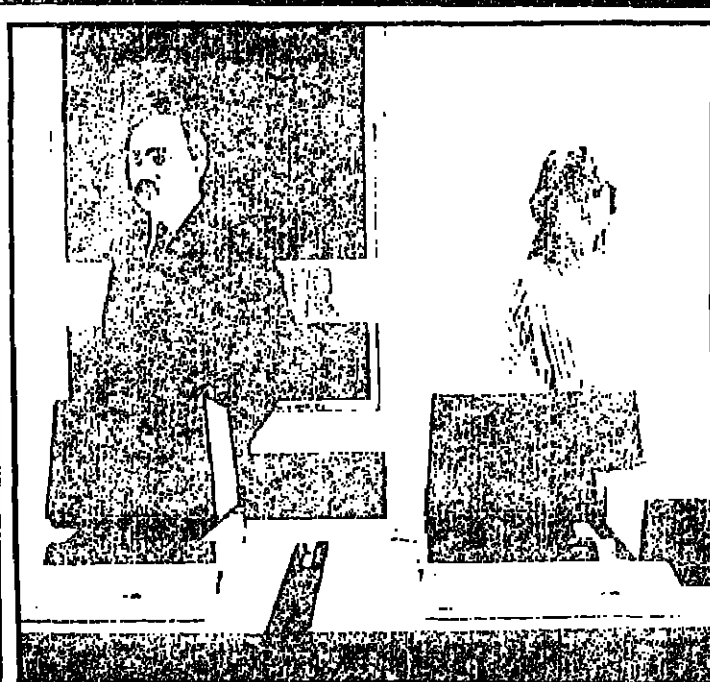


Eric Winkler, chairman of Panorama, with the new Personal Typing Centre.

levels of printer quality are maintained.

Development was based on producing a printer that was modular and robust in design, making it easy to manufacture and maintain. A quality assurance program is included in the manufacturing process and stringent environmental and reliability tests are carried out to ensure that high

levels of printer quality are maintained.



The dual screen word processor improves communications.

## Catering for lazy executives

LANIER Business Products, the US-based manufacturer of electronic office equipment, has launched a new word processor that comes with two screens, two keyboards, a 10 Mbyte Winchester disc and a daisywheel printer, price £7,250.

Called the EZ-2, the system has been designed so that an executive and his secretary can both use the same machine to enter text, make amendments, check spelling and so on without having to move from their respective desks.

In effect, the EZ-2 is a two screen multi-user/multi-tasking microcomputer system complete

with hard-disc storage and a letter quality printer.

The EZ-2 has 256K of memory, and a full range of software, including word processing, "Data-manager", EZ-Spell, "EZ-Task" and Greek word processing for academic/scientific text and equations.

A feature of the system is that one screen can be used for word processing, while the other can run any piece of CP/M compatible software.

Lanier Business Products (CW), Reunell House, 40A Mill Place, Kingston-upon-Thames, Surrey. Tel: 01-549 8741.

## Screen star.



The TeleVideo 924

In a family of great performers the TeleVideo 924 is truly a star performer, offering the power and versatility you would expect from the world's leading independent manufacturer of video display terminals.

Ergonomically designed, to both tilt and swivel, the non-glare high contrast CRT combines beauty with brains. Packed with features which include 16 non-volatile programmable function keys, 64 special graphics characters, 32 non-embedded visual attribute combinations, programmable delimiters, buffered printer port, reconfigurable keyboard.

Not the 924 a one night wonder, it will go on performing with unmatched reliability, an area in which its vertically mounted, convection-cooled logic board is setting new standards.

If you would like to see the TeleVideo 924 perform (or would like a more detailed biography) make a reservation with the able bodied people on the right.

معلومات

## Supporting cast.

As a supporting cast we will not be as well known to you as the star performer on the left.

In bettering the service that you can offer your customers though, we are just as essential.

Because a professional back-up service can mean the difference between you giving a customer the service he wants or giving him problems he can do without.

We'll give you, for example, a firm and competitive price.

We'll give you a definite delivery date (as a promise, not a guess) and we'll provide all the advice you need to make the most of every machine you sell.

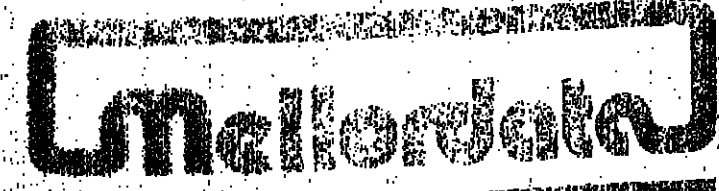
From a printer to a touch sensitive screen and beyond. And we guarantee our concern won't stop with the delivery van.

Mellordata's Field Engineering Group has been on the road for ten years keeping computers computing.

It all adds up to a service which has been greeted by warm applause wherever we have performed.

As with any performance though, it's always best to be your own judge.

Authorised distributors for TeleVideo and Mannesmann Tally. Exclusive distributor for Datamedia and Carroll Touch Technology. Authorised main dealer for Epson.

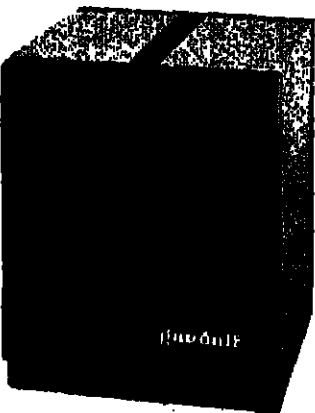


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## The Data PABX that grows with you

### MINI-PACX IV

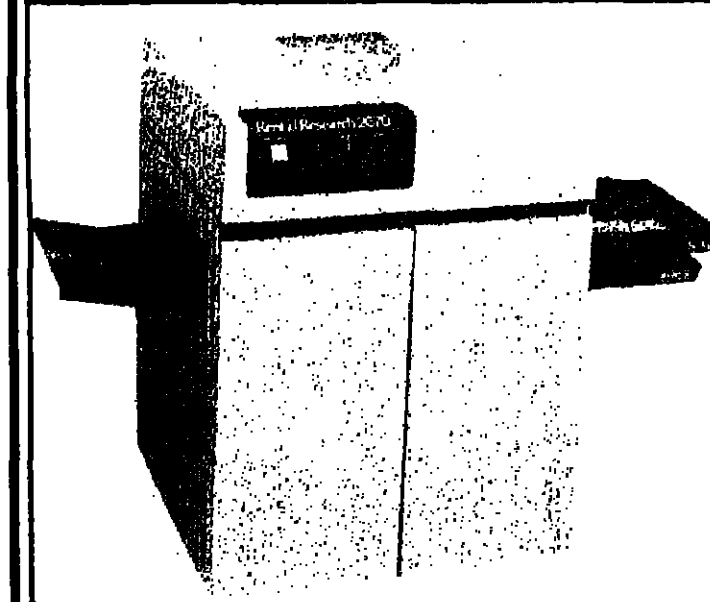
- data PABX for up to 48 terminals/32 ports
- modular for easy system expansion to 12,000 attached devices
- handles 9600 bps async, 19.2 Kbps sync data
- unlimited queuing for computer ports
- system monitoring statistics for network management
- provides system security features



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THE Rental Research 2670 laser printer has just been launched on the market.

It runs at a claimed speed of up to 28 pages per minute. It produces letter quality print with a standard dot density of 90,000 dots per sq inch.

With 1,300 fonts available, the 2670 can be adapted to suit the requirements of the individual user. Once installed, it can be easily upgraded if these requirements should change. Users have the facility to intermix fonts and print graphics, logos and signatures.

Rental Research (CW), 59-63 Warship Street, London EC2A 2DU. Tel: 01-247 5901.



## PRODUCTS

## Package for small retailer

WITH the increase in power of the microcomputer, DSI Retail has put together a microcomputer package called Microempac, designed for small non-food chains of up to 10 outlets or large multi-department single units, such as sports shops.

The system is written for the Sirius 1 computer, with 10 million characters of hard disc storage. The system is modular, and covers stock control and merchandising, purchase order management, ticket printing and reading.

A feature of the system is that stock is controlled down to branch, department, style, colour and size.

Hill Collier, general manager of DSI Retail, explains: "It is sometimes argued that the small retailer does not want control down to this level. We don't agree - if it's the wrong colour or the wrong size, then it just won't sell."

As well as current stocks, information is held on sales in each of the last five weeks and for year to date.



Stocktaking with a laser gun used in conjunction with bar-coded garment tickets.

The files are open to screen enquiries at any time and there are periodic reports to help decisions on stock replenishment.

DSI Retail (CW), Abelson House, Coventry Road, Sheldon, Birmingham B26 3PS. Tel: 021-742 3241.

## Foundry system gives better control

ADS COMPUTERS is to launch FO-COM, a foundry computer system designed to provide management of small and medium sized foundries with better control over operation and administration. In essence, the system will halve clerical time and increase productivity by 10%, says ADS.

FO-COM has been designed to minimise overstocking, supply and production bottlenecks, reduce paper work, administration and clerical costs, provide accurate costing, improve cash flow and increase productivity.

This is achieved by the control which FO-COM maintains over casting records, order processing, costing and pricing, acknowledgements, delivery schedules, shop loading, production control, invoicing, ledgers, credit control and payroll.

A suite of six major integrated programs contained within FO-COM include foundry operations,

master base, order processing, production control, accounts and payroll. Additional facilities include: weight estimating, quotations, on-line budgeting and word processing.

FO-COM's production control program allows job costing and future pricing to be analysed by the production of accurate information on productivity, scrap rates, output and cast weights, says ADS.

Over 100 sales and 100 debtors can be processed in one day by FO-COM's accounts facility. A suite of programs incorporates sales ledger, statements, aged debtor lists, purchase ledgers, nominal ledgers, sales analysis and numerous management financial reports.

ADS Computers (CW), Milton House, 172 Bath Road, Slough, Berks SL1 3XE. Tel: (0753) 821321.



Marconi's tracker ball.

## Tracker ball controllers

A NEW range of tracker ball controllers for mini and microcomputer systems and low-cost work stations has been introduced by Marconi Electronics Devices.

Known as the RB3, this tracker ball controller uses a 3in diameter ball supported in a low torque mechanism to translate an operator's two-dimensional hand movement into exactly equivalent electronic signals for precise positional control.

Marconi Electronic Devices (CW), Doddington Road, Lincoln LN6 0LF. Tel: (0522) 688121.

## PRODUCTS

## Back-up for 20 Mbyte Winchester in 4 minutes

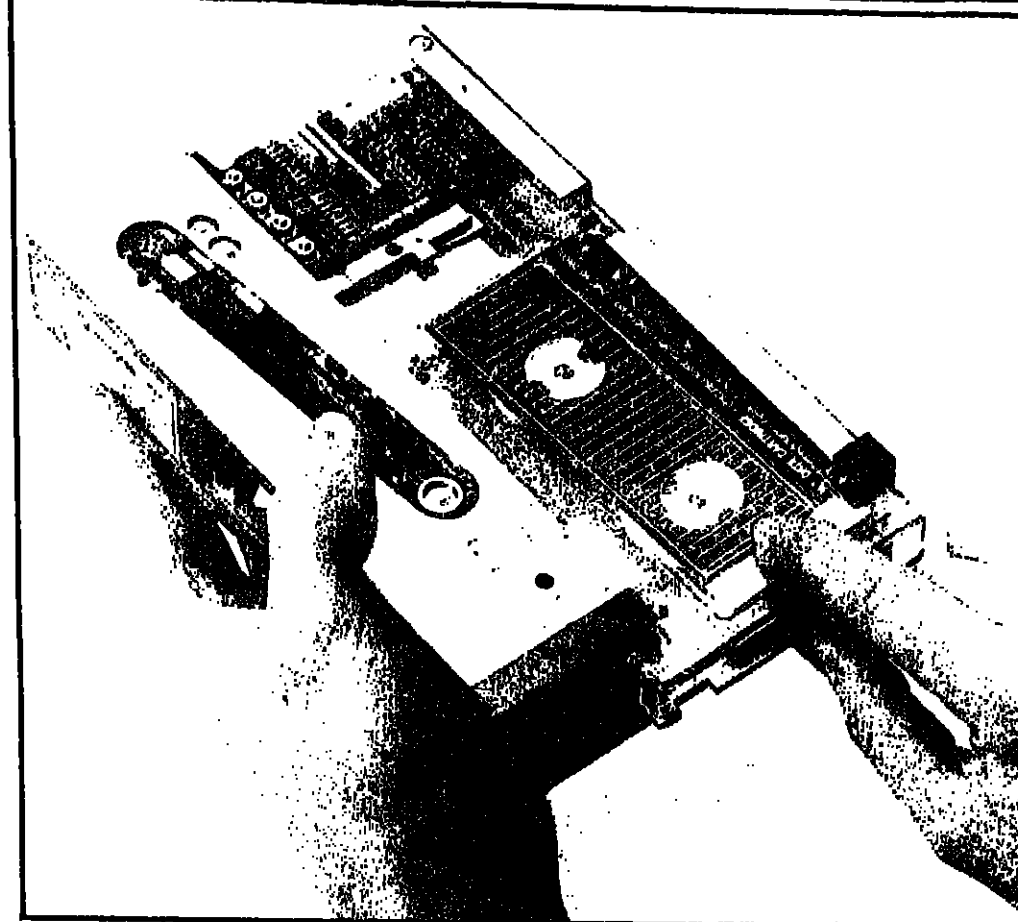
MICRO Memory Systems has launched in the UK a range of 1/4in tape streamers capable of backing up a 20 Mbyte Winchester in four minutes, or a 45Mbyte disc in nine minutes.

Designed for use in multi-user, multi-tasking computer systems and networks, the Wangtek Series 5000 tape streamers fit into the same physical space as a half-high 5 1/4in floppy or hard disc.

The intelligent formatter is also packaged in a half-high module, enabling the complete back-up system - tape drive and formatter - to be fitted into the same space as a full height 5 1/4in disc drive.

Data capacity is 20 or 45 Mbytes, and data transfer rate is 90 Kbytes per second at a tape speed of 90 inches per second. They use a serpentine recording form, with nine or four tracks, at a recording density of 8000 bits/inch.

Micro Memory Systems (CW), Kennet House, London Road, Newbury, Berks RG13 1JN. Tel: (0635) 40405.



The Wangtek Series 5000 1/4in tape streamers, now available in the UK from Micro Memory Systems.

## Data acquisition board for IBM Personal

DATA Translation has announced a data acquisition and control board for the IBM Personal Computer. Available for £295 (OEM quantities), the single board DT2808 includes analogue and digital inputs and outputs, an on-board programmable clock, and an on-board microprocessor.

Providing 16 channels of A/D with 10-bit resolution, two channels of D/A with 8-bit resolution, and 16 lines of digital I/O, the DT2808 is intended for applications ranging from industrial control, data logging, product testing and quality assurance to home energy management and security systems.

The DT2808 is part of Data Translation's seven-member family of IBM-PC compatible data acquisition hardware and software products. All of these are compatible with the IBM-PC, IBM XT, Compaq Portable, Eagle PC, Columbia Data Systems, and the

DEC Rainbow 100. The DT2808 design includes an on-board microprocessor which acts as the interface between the DT2808 and the host personal computer, controls all on-board analogue and digital I/O operations, does self-tests.

Alternatively, the DT2808 may be programmed using PCLAB, Data Translation's library of Basic-callable subroutines. PCLAB is a real time software package supporting all the analogue I/O, digital I/O, and clock functions of the data acquisition boards.

Also available with the DT2808 is the DT1707 screw terminal panel and DT752 signal conditioning/screw terminal panel.

The DT1707 is priced at £149 and the DT752 at £175 in single quantities. PCLAB is £495. Data Translation (CW), 430 Bath Road, Slough, Berks. SL1 6BB. Tel: (06286) 849862.

## Package turns PC into design station

DICOMED (UK) has announced a package of software and peripheral hardware which it says will turn an IBM Personal Computer into a design station which will produce high resolution business graphics.

Called the Dicomedia Micro 2, the system calls for no extensive knowledge of either computers or artwork techniques. With a minimum of training the operator can create graphics for a wide range of business and presentation uses. Pie charts, bar charts, column charts, line graphics, organisation charts and text are within the scope of the system.

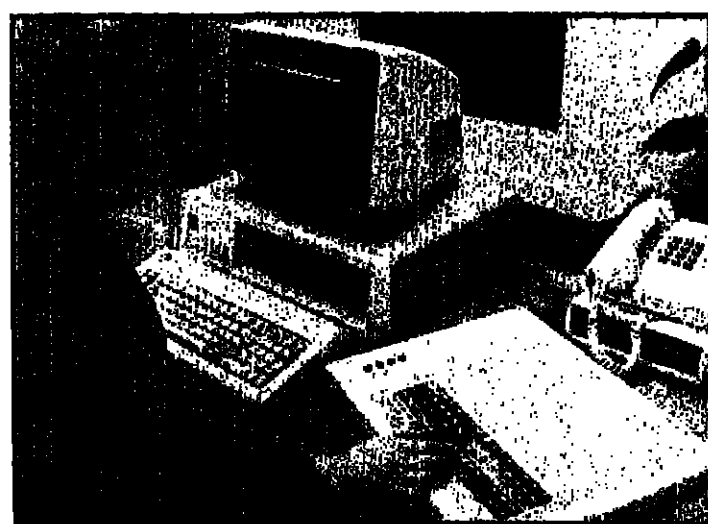
The design created on the IBM-PC is transmitted - via a telephone modem or on disc - to a Dicomed Colour Recorder for production of the final output. This is most commonly a 35mm slide, but can also be in the form of an

overhead transparency.

In addition to producing slides with high colour saturation and a resolution of 8,000 lines, says Dicomed, this process cuts costs by a good deal more than half when compared with conventional slide production methods. Origination costs are also lower as no typesetting, masking or keylining is required.

The Dicomedia Micro 2 package consists of the software and a graphics tablet. Text is entered on the keyboard and displayed on the screen. There are seven sizes of characters in Helvetica. Charts can be prepared automatically with the operator requesting the type required and entering the numeric data.

Dicomed UK (CW), Coworth Park House, Coworth Park, Ascot, Berks SL5 7SF. Tel: (0990) 27312.



The IBM-PC with the Dicomed graphics tablet.

## IBM-type terminals

ALTERNATIVES to the IBM 3278 and 5251 terminals are being introduced by CPU Peripherals in the shape of Esprit Executive 10/78 and 10/51. Both terminals have IBM layout keyboards and in conjunction with an appropriate protocol converter, will perform all IBM 3278/5251 applications with no software changes.

One-off end user recommended prices are £1,046 for Executive 10/78 (IBM 3278) and £1,075 for Executive 10/51 (IBM 5251).

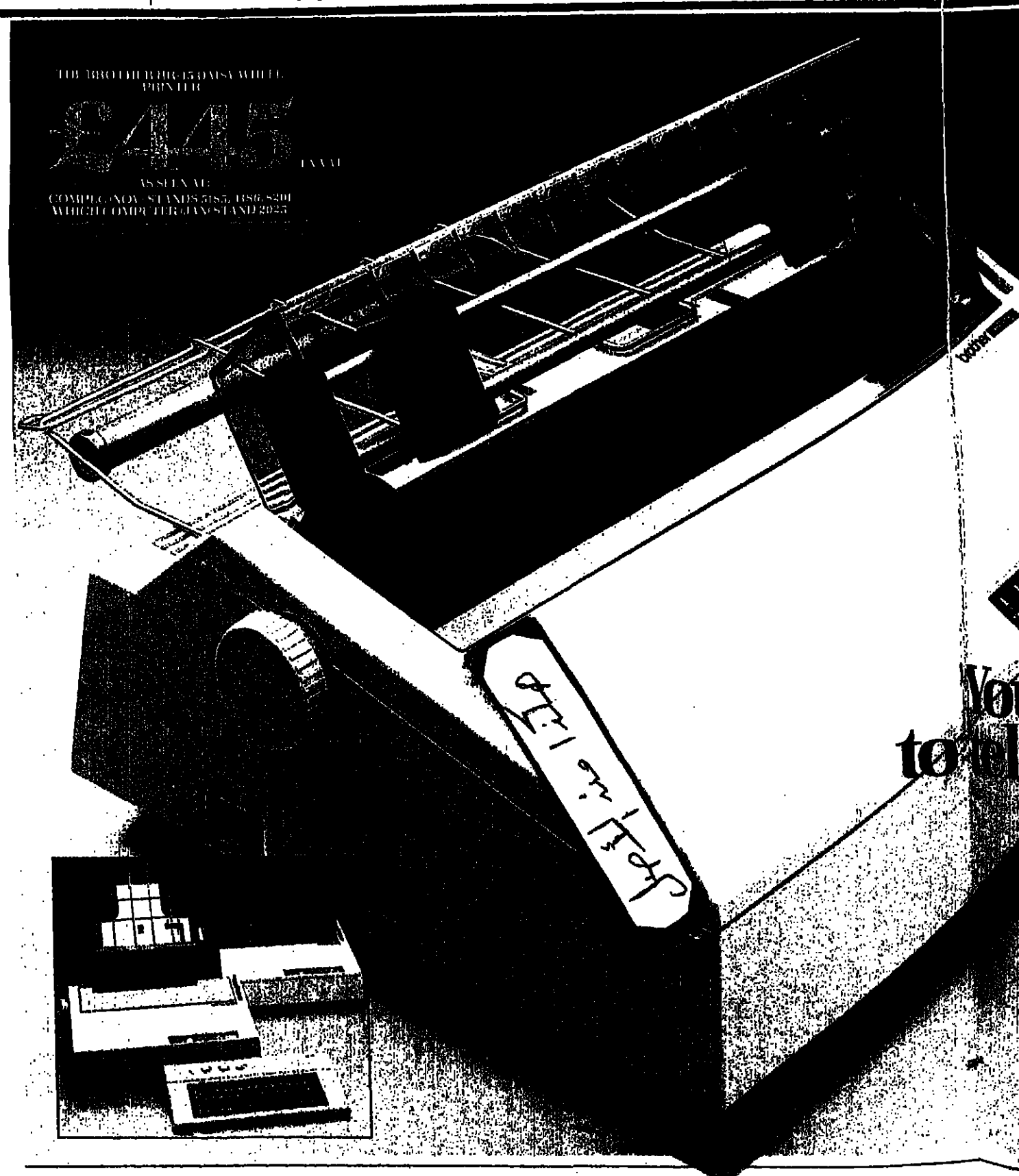
CPU Peripherals (CW), Rudd Industrial Estate, Govey Avenue, Shepperton TW17 8AQ.

## Microfloppy follow on

SHUGART has introduced a double-sided microfloppy disc drive capable of storing one megabyte of information on the industry-standard 3 1/2in media. The Shugart 350 is a follow on to the company's first microfloppy drive, the 300.

Designed to operate with the ANSI working standard 3 1/2in hard-shell cartridge media format the Shugart 350 provides six-millisecond track-to-track access time and 80 tracks per side.

Shugart Corporation (CW), PO Box 57, Woking, Surrey GU21 1AJ.



brother

Dept. B Jones & Brother, Office Equipment Division,  
Shepley Street, Guide Bridge, Audenshaw,  
Manchester M34 5JD.  
Tel: 061-330 6531 (10 lines), 061-330 0111 (6 lines),  
061-330 3016 (4 lines). Telex: 644092.  
BROTHER INDUSTRIES LIMITED, NAGOYA, JAPAN.

All you require is a little peace and quiet. By the time you've finished reading, you'll be convinced that the HR-15, from Brother International Europe Limited, is quite simply an outstanding printer at an exceptional price.

That's not to say it's basic. Far from it.

EVERYTHING YOU WANT FROM A PRINTER.

Daisy wheel, letter quality, and bidirectional printing at a speed of 13 cps (Shannon text), 18 cps maximum, is the platform upon which Brother have developed the HR-15. Making it an attractive proposition to business people and hobbyists alike. Take the daisy wheel itself.

Available in a host of typefaces, it comes encased in a protective cartridge.

As much to guard it from handling and prolong its useful life as to save you from dirtying your fingers.

A small point, perhaps, but it's indicative of just how far Brother go into the planning of their machines. Simple but ingenious ideas like a

ribbon cassette that snaps into place, plus a separate red ribbon.

Ingenuity that extends as far as a family of compatible accessories.

More specifically, the TF-50 tractor feeder for continuous paper feed.

The CF-50 cut sheet feeder for word processing and letter use. It can automatically feed 150 sheets of A4 size paper, and the movable roller guide allows you to slip in a different sized sheet without removing the unit.

Finally, an invaluable attachment for all small businesses, the KB-50 keyboard.

It transforms the HR-15 into a sophisticated electronic typewriter.

Allowing the HR-15 to be of more use around

the office than a lot of its competitors in the printer market. And, as with all of the Brother accessories, the price adds to the HR-15's economic performance.

SOPHISTICATED OPERATIONS AT YOUR FINGERTIPS.

As the functions, by necessity, become more complex, Brother have kept their operation as simple as possible.

At the touch of a button, the HR-15 can be set to continuously print whatever is stored in its 3K buffer. Making form letters and document duplicates no problem at all. It also leaves your computer free for other operations. To clear the buffer for new text, all you do is re-press the same button.

The HR-15 boasts proportional spacing which eliminates unsightly gaps between characters, giving a uniform appearance and highly professional finish.

For those finishing touches that give your print-out that something extra, the HR-15 can print in two colours, shadow print and underline.

All carried out automatically during the print run, as instructed by your program.

Should that program be of a scientific or unusual nature, the HR-15 can take it in its stride. Fractions, exponential or any other characters that require specialised treatment are dealt with by its super and sub script facility.

There's even an impact control to vary the character arm pressure on the paper, which is ideal for making carbon copies.

TAKING THE WORRY OUT OF INTERFACE.

An impressive array of capabilities which is equalled by interface and DIP switch options, thereby extending the versatility of its operation.

At no extra cost, the HR-15 offers a choice of either a Centronics parallel or an RS-232C interface and it's compatible with almost all the micro computers currently available.

There you have it, the Brother HR-15, its facilities, its simple plug-in accessories and its interface connections.

And for a price that gives you a lot more than you probably bargained for.

You don't need a computer to tell you which printer to buy.

## NCR system aimed at small hotels

THE NCR 2160 Lodging System is a guest accounting and food service system for small to medium-sized hotels and motels.

It handles accounting for advance deposits, registration, charge posting from the front desk or separate service locations, package deals, checkout, and city ledger.

Food service features include timekeeping and inventory options, wetproof micromation keyboard and multiple pre-set price keys.

Features of the system include an optional form number reader which automatically recalls previous balance information from memory. Personnel therefore do not need to enter manually numeric data such as room number and previous balance.

A memo key allows the operator to type in information after an entry on an account.

A variety of front desk, restaurant, bar and other revenue centre management reports is available.

A typical configuration, including a processor, five 2160 terminals, and a variety of printers sells for about £25,000.

The system will be available for delivery within two to three months.

NCR (CW), 206 Marylebone Road, London NW1 6LY. Tel: 01-388 8248.



The 2160 Lodging System.



The Chubb magnetic media protection cabinet.

## Protection for floppies

FLOPPY discs are easily damaged. Manufacturers recommend that they are not exposed to temperatures above 52°C or humidities above 85%. Even a hot mug of coffee if spilt or stood on a disc represents a hazard and a smouldering cigarette or fire would create temperatures which would destroy discs in minutes unless protected.

A new fire protection cabinet from Chubb provides protection at workstations for floppy discs, data

cartridges, tape reels, hard disc units, micro film and micro fiche, against fire, dust, magnetic fields from office equipment, humidity, unauthorised access, pilferage and accidental or malicious damage.

The cabinet has been awarded the VDMA-S60DIS label for floppy disc protection following independent fire tests.

Chubb & Son Lock & Safe Co (CW), 51 Whitfield Street, London W1P 6AA. Tel: 01-637 2377.



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Candidates should either have a B.Sc Engineering qualification with a minimum of 4 years D.P. experience or 7 years related job experience with 2 years as an Analyst. Experience in PL1 programming is essential with sound knowledge of some of the following skills: SP/OS, JCL, TSO, Project Development Methodology, Panvali Program Management, IBM Utilities, Flow Charting - Data Flow Diagrams, ISPF Dialogue Manager, Structured Programming Techniques, Documentation Writing.

The ability to liaise with users to define maintenance and development projects through to implementation with minimal supervision is essential.

### Systems Analysts - Training

Training in PL1, Fortran, TSO/SP/ CMS in an IBM environment operating under MVS/JES2 and/or VM.

In addition a sound knowledge of the oil industry and the ability to communicate effectively is essential.

### Systems Analysts

Candidates should either be degree qualified with 5 years IBM D.P. experience or a minimum of 8 years IBM D.P. experience. A sound knowledge of MVS, VM, SAS, TSO/SP/ PL1 and/or Fortran is desirable. Previous experience either as an Instructor or working as a member of a project team is an advantage.

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Candidates should either be partly qualified in Accountancy or have received formal or practical accounts training with a knowledge of computerised systems. In addition, the ability to communicate effectively at all levels is essential.

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As an Analyst you will have a working knowledge of financial systems, although, of particular importance is your ability to work closely and effectively with user management throughout our Organisation - 'somebody who can advise users what is best for them'. As a Designer we would be very interested if you have IBM database design experience, nonetheless, full training will be provided to ensure that you make the most of your ability.

Working in a project team environment you will have every opportunity for career progression to management levels. If your interests as a Designer are in more technical areas, then we have the scope for you to specialise.

Our location in Covent Garden makes for easy access from virtually all Main Line railway stations, and the Underground. Company benefits include Non Contributory Pension Scheme, Health Care Plan, Profit Sharing, Subsidised Staff Restaurant, Generous Holiday Allowance, and after a qualifying period, an Interest Free Season Ticket Loan and Subsidised Mortgage.

To find out how to achieve your ambitions by joining our Company telephone our Advising Consultant, **Stephen Brown**, on the SCR London office telephone number below or **04024 72160** evenings and weekends. Alternatively submit a detailed C.V. to him at the SCR London office.

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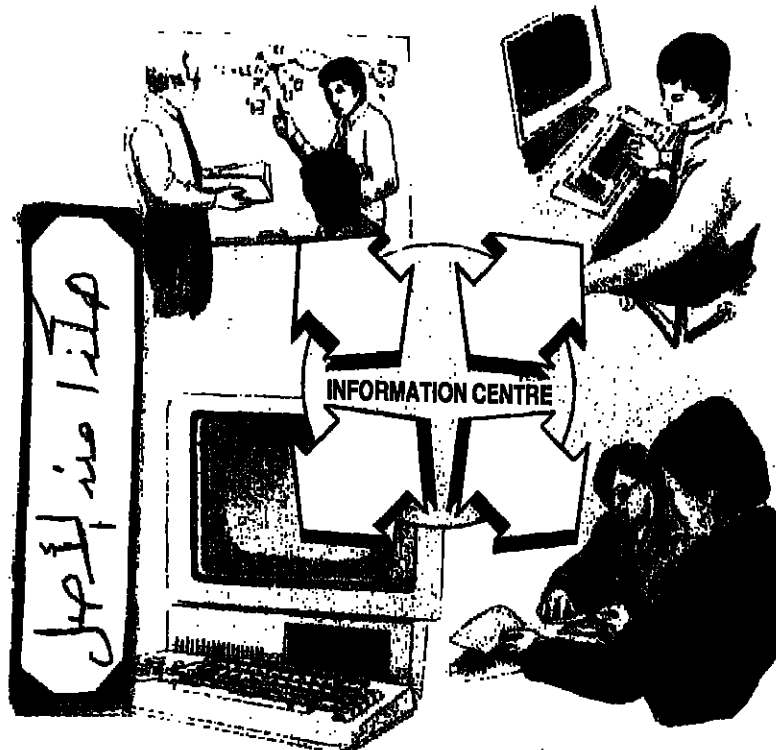
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# At the Centre of Development

The Information Centre concept grew from a need to provide users with a method for developing their own applications within a controlled environment utilising information and personal computing systems compatible with existing IBM architecture. We have established this concept, as ideas for new systems dedicated to specific applications can often be identified by users with practical experience of the job. In many cases however the relative simplicity of developing such applications does not merit the full project cycle. Instead the users can access the Information Centre for consultancy support and guidance on software tools along with educational and training support.

To ensure effective utilisation of the Information Centre we are building a team of specialists to link user requirements to the Information Systems Department. We now require a DATA SPECIALIST to augment the team.

Arthur Young McClelland Moores & Co. provide clients with a full range of accountancy services including consultancy. The firm has over 160 partners and more than 2,200 professional staff operating from 21 offices located throughout the country.



Arthur Young McClelland Moores & Co.

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## Analyst Programmer (Data Specialist)

We are seeking an analyst programmer, with database experience, to fill the role of Data Specialist. Responsibilities include managing the effective use and relevance of data resources, defining data requirements for end user applications and providing copy management facilities. In addition the Data Specialist will prepare data for manipulation by end user computing tools, so the ability to assess suitable software tools is required. The capacity to develop and implement education aids is necessary.

You should have four to five years programming experience with a sound Cobol background in at least two hardware environments one of which should be IBM, preferably 4341. Knowledge of high level languages such as RPG II, Easytrieve and database, such as DL/I, Total or Adabas is required, along with the ability to present the Centre's services to users.

Salary To £14,000

Location: London

For further details including company information please ring Francesca Drinkwater or return the coupon below.

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**Salaries**  
**£8,000 - £16,000**

**Covent Garden**  
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Our development programme creates NEW opportunities for Project Leaders, Team Leaders, Designers and Programmers who will enjoy dedicated 'state-of-the-art' development, based on powerful 32 bit super minis.

Whilst experience of ADA/APSE would be welcomed we recognise the need to train. We would therefore wish to meet with candidates possessing at least eighteen months' software engineering experience using PASCAL, or indeed any similarly structured language.

If you feel you can contribute to this exciting realisation of the user-friendly and intelligent computer systems for the Fifth Generation, contact our Advising Consultants Stephen Brown and Alan Carnell on 01 935 0671 or telephone in the evenings from 7.00 till 10.00 on Hornchurch 72610 or Harpenden 2976. Alternatively, submit a full Curriculum Vitae in confidence to our London office, marking this reference GS2.

(7438)

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to £13,000  
+ Overseas  
Allowance

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The successful applicants will be working on advanced software development projects in Holland, Italy, Sweden and other locations in Europe and Scandinavia.

JAS40/1

**NCR**

**PROGRAMMERS  
ANALYST/  
PROGRAMMERS**

Attractive

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LOCATION: N.W. LONDON

JAS39/2

**ITT COMMERCIAL  
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**SOFTWARE ENGINEERS**

£10-13,000

Over a century ago the Commercial Cable Company opened the first transatlantic cable. Today, they form part of the ITT Communications Operations Group, a worldwide network providing a variety of telecommunications services. As the company continues to expand so will their teams of dedicated software engineers. Applications are now invited from computing professionals with any of the following experience to work on development projects:

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In return we offer competitive salaries and excellent conditions of employment.

LOCATION: CITY

JAS40/3



Confidential Reply

**SOFTWARE ANALYSTS**

Excellent  
+ car

Our client is a world leading manufacturer of de-bit minicomputers. The support team plays a vital role in the increasing demand for the company's products. Vacancies exist for Software Analysts to expand the team responsible for UK and Northern Europe software support. Experience is required in two areas:

Scientific, Technical and Real Time - applicants should have four to five years' experience in a scientific, industrial or Real Time environment and be fully conversant with operating systems and communication software, scientific high level languages and/or assembly.

UNIX and C - applicants should have in-depth experience of UNIX and/or C and will be involved in a challenging role of design and development support of UNIX and its associated products.

We offer excellent salaries, company car and a range of benefits normally associated with an organisation of our standing.

JAS40/4

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## AN IMPORTANT MESSAGE FOR CONTRACTORS!

We are interested in hearing from all established contractors who are available for reassignment and also those who are intending to become freelancers within the next six months.

If your expertise is of a proven high calibre and your skills are not advertised then you are still most welcome to register with us as many of our clients' requirements are satisfied from our databank without the need to advertise.

Previous applicants are invited to update their registration.

Current requirements include:

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IBM 8100 DPPX, COBOL  
ICL VME COBOL, DDS, IDMS TPMS  
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MINI/MICRO EXPERTISE  
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PERMANENT

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Applicants should have around two year's experience of analysis and design, ideally in an on-line environment utilising database techniques. Knowledge of DOS/VSE, CICS or DL1 would be an added advantage as would experience of manufacturing or financial systems.

As well as attractive salaries benefits include 5 weeks holiday, pension and life assurance schemes, two subsidised restaurants and extensive sports and social activities.

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**SPL**  
International

**ANALYST/  
PROGRAMMERS**

to £14,000

SPL International is one of Europe's leading systems and software houses. Our Information Systems Division is currently seeking Programmers and Analysts to join them in the design, development and system testing of several sophisticated applications. These systems are developed to the highest professional standards, using advanced implementation techniques. The projects are based in London, however opportunities also exist for overseas assignments.

Applications are invited from Programmers and Analysts with sound knowledge and experience of Cobol, preferably in a banking or financial environment. Successful candidates will receive an excellent salary which will reflect both your own experience and the importance of these projects.

LOCATION: LONDON

JAS38/1



Confidential Reply

**TRAINER**

Attractive

Our client is a progressive training and applications software house. Their specialised areas of experience lie in the fields of financial planning, word processing and database management utilising a broad range of microcomputers. Increasing demand for the company's products and services has created a requirement for a Trainer who will be responsible for devising and implementing customer training courses. Specific areas of interest will be a knowledge of financial management/planning systems (ideally Multiplan, Visiolec and Superoleo) and word processing systems. The ability to write technical manuals will be necessary and experience of IBM PCs, CPM and Basic would be a definite advantage. Our client will offer an attractive salary and opportunities for career development as the company grows.

LOCATION: MIDDLESEX

JAS39/3

We should be talking to each other.

**DESIGNERS &  
IMPLEMENTORS**

**SYSTEM 25  
to £11K**

The ICL Retail Business Centre in Enniskillen provides total systems solutions to clients who range from the high street shop to the vast hypermarket.

It's a business area that's rapidly expanding and ICL are currently exploiting EFTS, new POS terminals, communications networks and sophisticated business applications.

This in turn has created some exciting opportunities for Designers and Implementors for System 25 in Retail environments, and with ICL such professionals can expect some equally exciting rewards and benefits.

To join the Retail Business Centre, you should have at least two years' experience of System 25 programming and be able to express a real commitment to exploring this challenging market area.

LOCATION: BERKSHIRE

JAS39/6



Confidential Reply

**ANALYST/  
PROGRAMMERS**

£10-£12,500

Established in 1984, over 50% of our client's business is in mail order management and direct mailing systems and services. Continuing development has produced the most advanced computer mailing software and systems available in the UK supported by a large and stable team representing over 80 man years of software development and mailing applications. Expansion has created vacancies for Analyst/Programmers with good commercial Cobol programming experience gained in an IBM DOS/VSE environment. Familiarity with VOLLIE, CICS, SHELCOPI or LIBRARIAN would be helpful. Personality and communication skills are essential as client contact will form an important part of these positions. In return our client will offer excellent salaries which are negotiable according to experience and a comprehensive benefits package.

LOCATION: CITY

JAS39/4

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## Systems Analysts RPG III Programmer/Analysts c £10,500 c £9,000

Recently a great deal has been said about the scope and opportunities to be found in Wales, but at Laura Ashley we've been aware of that fact for a long time. Over 20 years to be precise. In the rural beauty of Mid-Wales we have developed the home furnishing and fashion products that have made us internationally famous, investing in every kind of resource that will enhance this success still further. DP is one of our prime commitments. We have established an IBM System/38 facility that is at the very forefront of development, serving a diverse range of applications. But because we're ambitious and forward thinking, we do not intend to stop there. We want to maximise our computer power and consequently are investigating many new areas of involvement. That's where your challenge starts.

### Systems Analysts (2 positions)

If you would like to be part of an exciting development programme covering Production, Retail and Financial systems in an online database environment, then we would like to hear from you.

System/38 experience is not essential. What is more important is an ability to develop systems from the initial feasibility stage through to full implementation with the minimum of supervision.

### RPG III Programmers/Analysts (2 positions)

If you are an RPG III programmer with at least 18 months application programming experience we would like to hear from you.

We are starting a large scale development programme covering production, retail and financial areas in an online database environment involving the setting up of an international network.

You should be able to involve yourself totally in a department that expects its development personnel to liaise directly with users with a minimum of supervision.

Benefits for all positions include a 4½ day, 38½ hour week, 4 weeks holiday, discount on company products and generous relocation assistance when appropriate.



'Phone Richard Milsum, for an informal and confidential discussion of your requirements on: 01-354 1055, during office hours or on 01-958 2553 evenings and weekends. Alternatively please send full details to me at: March Computer Recruitment Ltd, 1 Noel Road, London N1 8HQ

(7617)

## Mid-Wales



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Applicants will probably be in an Analyst/Programmer role with experience of Honeywell L6 Cobol and/or Screenwrite. Strong user skills are essential as there will be a considerable amount of contact with management departments. The successful candidate will also have the opportunity to work with microcomputers.

In return our Client offers a good starting salary with regular reviews, 22 days' holiday, NCPS, relocation assistance where necessary and other large company benefits. If you are able to work on your own initiative and enjoy a challenge contact Mike Harmer for further details.

(7628)

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## CORAL CONTRACTS

We require analysts and programmers with experience of CORAL for a number of interesting and rewarding freelance assignments throughout the North. Should you be available now or in the near future then send a detailed cv or telephone me, Peter Moore, for an initial discussion.



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Please write with brief details of experience and current salary to:

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(7570)

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Generous relocation expenses.

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(7533)

## Senior and Junior Programmers

STC Components, leaders in the manufacturing and distribution of electronic components, has an ambitious data processing expansion programme for 1984, coupled with an expanding business.

Our current hardware consists of a Tandem Honeywell D.P.S. 300, supporting over 300 terminals and ten I.B.M. System 34 minis, currently running the M.A.A.P.I.C.S. manufacturing modules, but with plans for further developments and enhancements.

To aid this expansion, we now want to recruit computer programmers with a minimum of one years experience in either Cobol or R.P.G. II to join us at our Harlow Headquarters. The duties of our Cobol Programmers are based around the writing and testing of programs through to completion, whilst the major function of our R.P.G. II programmers will be to write and test programs on the manufacturing system 'M.A.A.P.I.C.S.'

Successful applicants will have excellent career prospects in both the programming section, and in other parts of the Data Processing Department. Salaries are set at very competitive levels, which take into account the current market rates, age and experience of the individual, and are reviewed at regular intervals.

Benefits include five weeks holiday and generous relocation assistance, where appropriate. In addition, our Harlow Headquarters are within easy reach of London and excellent cultural and recreational facilities.

Please send full personal and career details to Phil Gray, Headquarters Personnel Department, STC Components, Edinburgh Way, Harlow, Essex. Tel: Harlow (0279) 26811 Extension 2690.



**STC COMPONENTS**

# PERMANENT

**Chief Programmer** **Surrey** **Up to £14K**  
A major multinational company currently require a Chief Programmer with a minimum of four years' COBOL with a working knowledge of DEC VAX/VMS. Ref: 8412/PM

**Software Engineer** **Bucks** **Up to £12K**  
If you are, educated to BSc/HND level, fluent in PASCAL (or other block-structured language) and have experience of DEC hardware you should apply now. (Relocation expenses will be paid). Ref: 8413/PM

**Analyst Programmer** **Surrey** **£13,500**  
**£8,000**

Owing to expansion a major company currently running an IBM mainframe require  
a) An Analyst, aged around 28, with around five years in DP (two of which in analysis).  
b) A Programmer with around a year's solid COBOL on any mainframe. Ref: 8414/PM

Contact Peter Hennessey at KPG or on 0293-516322 (evenings and weekends)

**Programmer/Analyst** **West End** **To £15,000**  
With a System 38 due the MIS department of this US corporation has a very full development program. To ensure that priority projects are completed on time they now need two experienced System 38 professionals. Ref: 8332/MJ

**Analyst/Programmer** **Middlesex** **To £13,000**  
A major bureau operation supporting both IBM and DG hardware is currently looking for experienced A/PS with DG BASIC under RDOS. Additional experience of PL/I or COBOL is an advantage. Ref: 8332/MJ

**Analyst/Programmers** **West London** **To £12,000**  
A newly formed software house, this company has recently been awarded a major new development project. The environment is IBM 4300s under DOS/VSE using CICS - VSAM and IDMS - the applications required are Banking and Insurance. Ref: 8411/MJ

**Systems Programmers** **Berks/Middx** **To £15,000**  
A major new IBM site is looking for two young systems programmers to join the support function. You should have had at least two years' experience of VM or MVS and some knowledge of either SNA or X25 protocols. Ref: 8404/MJ

Contact David Mason John at KPG or on 01-891 0906 (evenings and weekends)

**Systems Engineering Support Analyst** **Kent** **£12K + P.a. Neg.**  
Minimum five years' analyst background. To work on systems configurations, systems design and S/W design, including CAD package. Ability to supervise day-to-day H/W evaluation. DEC RSX-11M MACRO II FORTRAN experience an advantage. Ref: 389/DF

**Programmer Technical Support** **Central London** **£12K Neg.**  
Graduate preferred, minimum three years' COBOL programming experience with ability to communicate effectively at all levels. To design interrogation packages for users, prepare and present in-house training courses and provide technical support. Opportunities for some travel. Ref: 388/DF

**Project Ldrs/Consultants and Programmers** **Central London**  
Minimum two years' experience IBM 34, 36 or 38, RPG II or III, - £11K. Project Leaders/Consultants with good DP experience - £Neg. Banking or Insurance preferred. Above to work in areas of Dev., MKTG or Quality Assurance. All applicants must be willing to travel abroad at short notice. Ref: 387/DF

**Programmer** **City** **£9.5K**  
Two to three years' experience of PL/I, TOTAL or WANG with COBOL. Ref: 400/DF

**Programmers** **Kingston** **£10K Neg. + Benefits**  
Eighteen months to two years' PL/I + SHADOW or CICS structured programming VSAM. Ref: 401/DF

Three to four years' PL/I + SHADOW or CICS structured programming VSAM. Ref: 402/DF  
Contact Diana Fabregas today at KPG or call 01-789 8714 (evenings or weekends)

**Technical Consultant** **Bristol** **Circa £11,500 + Car**  
Minimum four years' experience on IBM Hardware with fluency in COBOL could qualify you to enter into an exciting environment providing technical support for new products recently imported from the USA. Accounts and finance applications background desirable. Comprehensive relocation package available for the right person. Ref: 8393/HP

**Analyst Programmer** **Hants** **£10,000 +**  
Our client, a rapidly expanding electronics company now seek an ambitious Analyst Programmer with a sound background in a 'DEC' orientated environment. Broadbased application experience together with 'Mumps', RSX-11, and DSM operating systems could afford you entry into an interesting and challenging environment. Ref: 8378/HP

**Realtime Programmers/Software Engineers** **Herts** **To £17,000**  
A progressive British based company specialising in the design and manufacture of highly sophisticated Data Communication equipment is now undergoing a period of rapid growth and development. The challenges are enormous, so too the potential for self development. If you are familiar with 8080, 280 and 6800 microprocessors or conversely have a history of achievement in a Data Communication environment, this is the opportunity to stretch your career on to new and exciting fronts. Ref: 8338/HP

Contact Haydn Parry at KPG

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## CHIEF SYSTEMS ANALYST

Circa £13,950

The Royal Liver Friendly Society, Liverpool, one of the largest collecting assurance societies in the country, with funds of over £340,000,000, has a vacancy for a Chief Systems Analyst. The Society has an I.B.M. 4341 Computer with 4 megabyte memory using fixed disks and tapes. Additionally, a number of colour VDUs located in User Departments are attached to the mainframe. Several major new systems are currently at an early stage of development. These include network development and the use of microcomputers. To assist in the planning and control of these systems a Chief Systems Analyst is required. The successful applicant will report to the Systems and Programming Manager leading a team of some 20 Analysts and Programmers. He/She will be at least 30 years of age, must have had a minimum of 5 years experience as a Systems Analyst, and have led systems development work on major projects. Knowledge and experience in the field of communications and microcomputers would be a distinct advantage. In addition to a salary of £13,950, fringe benefits include annual bonus, 35-hour week on flexible working hours, and contributory pension scheme. Generous concessionary rates of interest for House Purchase and re-location expenses where appropriate are also available. Written applications, giving full personal details, qualifications and experience, should be addressed to:

Mr. M. E. Penny,  
Management Services Manager,  
Royal Liver Friendly Society,  
Royal Liver Building,  
Liverpool L3 1HT.  
Tel: 061-236 1481 (Ext. 271).

**Royal Liver Assurance**

## ANALYST/PROGRAMMER

New challenge in the Leisure Industry

**Fylde Coast** **c.£9,500**

The DP Manager of this thriving member of a substantial UK group, involved in the Leisure Industry, needs the support of a talented and innovative Analyst/Programmer. Following a brief period of systems maintenance which will familiarise you with the organisation and its DP procedures, you will play a major role in transferring existing work on to a Honeywell Level 64.

The company is expanding its DP activities and this is an ideal opportunity to be in at the ground floor of new developments. If you are an enthusiastic, ambitious, Analyst/Programmer, with COBOL and possibly BASIC experience, this thriving company offers excellent rewards and future prospects.

C.V. to: Cathy Homer, P.E.R., 8th Floor, Victoria House, Ormskirk Road, Preston PR1 2DX. (7653)

**PER** Executive Selection

Chr. Michelsen Institute is an independent multi-disciplinary research institute which serves industry and society in Norway and abroad. The work of the Institute is financed by means of government grants and by R and D Contracts.

CMi's dept of science and technology has a staff of 105, most of whom are graduate scientists or engineers.

### COMPUTER GRAPHICS/ANIMATION

Applications are invited from highly qualified and suitably experienced persons for a position in computer graphics and animation. Applications with a Ph.D or M.Sc in computer science will be preferred.

Research activities in the dept of science and technology are concentrated in the following areas:

- Powder technology, dust and gas explosions
- Instrumentation and measurement technology
- Remote sensing and image processing
- Signal processing, including seismic interpretation
- Mechanical design and precision engineering
- Electronic design

Many of our projects in these fields utilise computers for simulation, data reduction, and design purposes. In order to enhance our ability to interpret and understand computer output, we plan to expand our use of computer graphics and animation techniques. Further details of this challenging appointment can be obtained from Haakon Helland at CMi. Deadline for applications is February 20, 1984.

CMi offers competitive salaries and an attractive work-place on the outskirts of Bergen, on the west coast of Norway. The Institute will assist in obtaining suitable accommodation. Applications, accompanied by curriculum vitae, should be sent to the Director, Dept of Science and Technology,

Chr. Michelsen Institute  
Fantoftveien 39  
Fantoft, Bergen, Norway.  
Tel: + 47 5 284410; Telex: 40008 CMi N (7578)



**THORN EMI**  
**Electronics**  
DEFENCE SYSTEMS DIVISION

With the further development of high technology Video Processing equipment, we are looking for Team Leaders and Software Engineers; people who need an outlet for their innovative and technical abilities. The work is demanding and exciting with scope to progress within the organisation for ambitious and talented individuals.

Based at Feltham, or our new facility being established at Woking, Surrey, you will be involved in the very latest developments of video processing equipment, utilising an excellent array of design tools. Experience of working on high speed, real time systems using minis and micros, particularly PDP 11 or VAX using CORAL, or INTEL 8086 using Assembler is desirable.

These unique positions command salaries of £8 - £14K with excellent large company benefits.

Write or phone for an application form to Judy Ball, THORN EMI Electronics Ltd., Defence Systems Division, Victoria Road, Feltham, Middx. Tel. 01-890 3600 or 01-751 0702.

There are a few people who could make Isaac Newton turn in his grave...



They are the professionals who through one simple quality, ambition, can put paid to the theory 'what goes up must come down'. This sheer determination to get ahead keeps their careers progressive and optimises the scope of their responsibilities. But they need the right environment. In only a few years HAL Computers Ltd have grown through a policy of high standards, aggressive marketing and a commitment to use some of the best products to become the largest independent peripheral distribution houses in Europe. Few other companies can rival their success or opportunities. If you want to get to the top and have the ability this is the company where you will find the head room.

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This key role is concerned with developing and servicing their continental sub-systems distributorships, making full use of a first class product range and excellent technical back-up. A European language plus an in-depth appreciation of both European markets and the approach to business would be a distinct advantage. They say that you can't keep good professionals down; this is a company that wouldn't want to.

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You will be joining a company that thrives on technical excellence and that will expect you to achieve a similar standard, customising products to meet their clients needs. In your mid twenties with good communication skills and business acumen you are likely to have gained your expertise of Apple or IBM PC operating systems in a small software house.

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# ... NEW IBM Installation

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+ benefits

A new Company has been established to provide a Parts and Equipment distribution facility for one of the UK's leading Manufacturing Organisations. From a prestigious base on the South East Boundary of Birmingham, the Company will provide an autonomous service centred on IBM hardware - initially IBM 3031 AP under MVS using TOTAL and ENVIRON 1. A Management team has been recruited to provide the impetus to a challenging systems development plan to cater for the needs of the business.

A key position exists for a **SYSTEMS PROGRAMMING MANAGER** - to head a team engaged on technical support to the installation. This important post calls for a strong technical knowledge of IBM MVS environments including database and telecomms (ideally TOTAL/ENVIRON 1 CICS). Areas of responsibility will include Databases, Personal Computing, Operating Systems, as well as

planning future technical enhancements to the installation. Candidates should possess the ability to combine technical knowledge with effective man management skills and be able to contribute to the forward planning of the Company.

The installation is located in an attractive area close to the green belt and surrounding areas provide a large choice of housing prices and styles.

An excellent salary will be paid, enhanced by 2 leased cars under a Management Car Plan, and medical cover through BUPA. Comprehensive and generous relocation assistance is available to this delightful area with easy access to the rural countryside of Warwickshire and Worcestershire.

To apply please contact the Advisers to the Company, **Grahame Murphy or Martin Stalnhorpe on 021-236 3781** (24 hour answering service) or 021-778 2974 till 9.00 pm evenings.

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Manchester M3 3EE  
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Our Client is one of the largest IBM users in the UK, running an expanding nationwide teleprocessing network of over 1,800 terminals and RJE's, from two major IBM Data Centres, one of which is located in a pleasant, rural area of Essex.

The site maintains an impressive configuration comprising IBM 3033 and Amdahl V7 mainframes running MVS/JES2, IMS DB/DC, CICS/DLI, VM/CMS, RAMIS, NCP, VTAM, MSHF, and TSO/SPF. A hardware upgrade, possibly involving the installation of a third large mainframe and migration to MVS/XA are planned for this year.

In such a progressive environment, opportunities for career progression are excellent. Openings currently exist for Systems Programmers with varying levels of experience, who seek broader technical involvement with the very latest in IBM systems software.

Applications are therefore invited from Systems Programmers with at least twelve months experience, ranging up to Senior Systems Programmers, where, at the more advanced levels, specific skills in perhaps VTAM or IMS would be especially welcome.

Whatever the length or breadth of your experience, our Client is keen to discuss the future with you and, in simple terms, will pay you what you are worth.

Apart from superb career prospects and involvement with the latest IBM hardware and software in a developing site, you will benefit from on-going training and excellent working facilities in a new and well equipped Computer Centre, situated in clean, rural surroundings, away from the 'commuter crush', yet only 35 minutes by rail from London and within easy reach of the popular East Coast resorts.

For Systems Programmers looking for room to develop their careers in a large and well resourced IBM environment, our Client offers unrivalled opportunities for personal and technical development. If you wish to refresh your career, start by sending your c.v. to **Ian Payne** at the SCR Birmingham office, giving details of current and expected earnings, home and work telephone numbers (to be used with the utmost discretion) who will arrange to meet with you in confidence at SCR offices in either London, Birmingham or Manchester to suit your convenience.

Technical, Sales & Management Appointments

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James House, 40 James Street,  
London W1M 4HS  
01-836 0671/488 1481

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International House, 84 Deansgate,  
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061-833 0427

**BELGIUM**  
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010 322-840 7161/71

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## SYSTEMS CONSULTANTS

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You will undertake feasibility studies and provide advice on the selection of hardware and software and the subsequent installation planning and implementations. As you will also be developing requirement specifications you must have a thorough understanding of all aspects of DP with the ability to communicate with all levels of management. Previous consultancy experience would be advantageous. The companies are located, mainly, to the North of London and there will be some travelling.

Salary is negotiable according to experience and will be accompanied by a generous benefits package which includes a non-contributory pension, group BUPA scheme, subsidised restaurant, and after a qualifying period, loan and mortgage facilities.

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## ANALYST/ PROGRAMMERS

### IBM SYSTEM 34/SYSTEM 36

Croydon/London £8,500-£11,000 plus large company benefits

Our client, a multinational blue chip organisation requires additional System 34 professionals to meet their current expansion plans, which include upgrading to System 36.

The successful applicants will have a minimum of 3 years RPG II experience on System 34 and/or System 36 in a distributed processing environment.

The company offers excellent working conditions and benefits which include four week's holiday, free life assurance, non-contributory pension scheme, restaurant facilities.

TP

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TLP Leon House, High Street,  
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10 Grenville Place, London SW7 4RW

Telephone 01-373 3063

## Software Tools

Central London: Salaries to £18K

Software Designers and Managers, with at least four years experience in software design and development, are urgently required to join our clients, newly created team. As this leading Systems and Software House is aiming to utilise a variety of tools and methods in their software environment, specific experience is less important than high basic ability and a strong interest in improving the development process.

However, candidates who have developed Programming Support Environment (e.g. APSE), Software Productivity Analysis (Project Management Tools) will be of particular interest. Although these positions will be extremely demanding, job satisfaction will be high and successful candidates can be assured they will remain at the forefront of software methodologies. Ref: L/5/A

## Comms Software

Overseas: Package to £22K

An internationally renowned Systems House and Computer Manufacturer has recently launched a range of Data Communications and Networking Products and is, therefore, seeking additional Programmers and Designers. Suitable applicants should hold a minimum degree and have at least three years relevant post-university experience with either a Systems and Software House or mini/micro computer manufacturer. In particular, you will be expected to have an in-depth knowledge of Data Communications, Networking Systems (LAN's or WAN's), communications protocols (X.25, SDI/C/HDL/C) or office automation systems. Successful applicants will undergo intensive product training at the Company's Copenhagen Head-Quarters and, thereafter, you will be based in USA, Singapore or an E.C. country. Ref: L/5/B

## Micro Applications Consultants

London and E. Midlands: Salaries to £25K (O.T.E.)

Profile: Keen Computers Ltd is a leading supplier of UNIX based systems and networks in particular OMPACT and is again poised for a period of planned growth in 1984. The Company has recently established a network of nationwide service and support centres with its Regional Head-Quarters based in The City and Nottingham and support offices in Bristol, Manchester and Slough.

Personnel: Applicants aged 25-35 years should have practical programming, systems analysis or design experience, aimed in a commercial environment. Your programming background must include fluency in two or more of: PASCAL, C, COBOL, C++, FORTRAN or Business BASIC. Of particular interest will be those who can combine a sound knowledge and proven experience of applications software in such areas as word processing, database management, operating systems and communications software. Candidates who are familiar with UK accounting practices are also encouraged to apply.

Job Content: All positions entail a significant degree of client contact in the form of product demonstration, seminars, in-house and on-site client training, and post-sales support. Well developed interpersonal skills are therefore essential. A willingness to travel within the UK and when necessary overseas is also of paramount importance.

Rewards: Earnings will only be limited by your ability since in addition to a very competitive salary, our clients offer an outstanding sales and performance related bonus scheme. All positions carry generous car allowance or company car.

Applications: Please forward a well documented resume or alternatively telephone one of our Consultants quoting Ref: L/5/10.

## Graduate Programmers

London & H. Counties: Salaries to £8.5K

A number of exciting opportunities have arisen in London and the Home Counties for Programmers who graduated in 1982 or 1983. You should hold a first or second class honours degree in Computer Science, Mathematics or Electronic Engineering and, of particular interest, will be applicants who additionally hold an MSc. It is essential for all positions that you offer fluency in PASCAL, C, ADA, PROLOG, LISP or Assembler. Ideally your project work and/or subsequent experience should include compiler writing, expert systems, firmware development or UNIX.

Ref: L/5/A

## Real-Time Systems

Dorset: Salaries to £16K

The recently created subsidiary of a major Systems and Software Consultancy has a number of vacancies for Real Time specialists. From Programmer to Project Leader level. Current projects include the development of C, packet switching and guided weapons systems for both UK and overseas clients. Their requirement is for candidates who have been engaged on the development of real-time systems utilising high level, block-structured languages such as Pascal or RTL/2. Alternatively, our clients will consider those with a micro-Assembler background or fluency in Fortran, especially if supplemented by exposure to a structured development environment such as MASCOT. Ref: L/5/F

## VAX/FORTRAN Progs

London: Salaries to £12K

An International Systems Company specialising in the development and marketing of communications software is seeking additional Programmers and Designers for its London Headquarters. Candidates, aged 22-27 years, should hold a tertiary degree and have a minimum of twelve months FORTRAN programming experience, preferably gained in a PDP-11 or VAX environment. Application areas of interest include Office Automation, Viewdata and Prestel, Data Communications and Distributed Processing. Since these positions entail a high degree of client liaison, you should possess excellent personal communication skills and be prepared to travel both nationally and internationally. Ref: L/5/F

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# WORLDWIDE COMMUNICATIONS SYSTEMS Project Managers

**£16,500-£18,500 + car**

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Our client, with development headquarters in London, was established more than a decade ago and is currently a market leader in the Financial, Banking and Trading areas.

The Company are looking for Project Managers for their Communications Development Group to enhance their existing highly successful operations and, at the same time, establish a new generation of software to service its worldwide client base through its Operating Companies in the USA, Far East, Middle East and Europe.

The successful applicants may be drawn from a wide range of backgrounds, but must have realtime or online development experience in a communications environment, be highly motivated individuals and able to work on their own initiative. They should also be willing to travel, both in the UK and overseas.

Systems are presently based on DEC PDP11 and VAX hardware but future strategy is to make the software portable and therefore implementable on other CPUs.

This is an ideal opportunity to influence the direction of future products, to grow with an expanding international organisation, and to be responsible for the design and implementation of their next generation of communications developments.

For further information, please contact Jenny Dalrymple-Hay or Ian Murray West on 01-493 2947, from 8am to 10pm Monday to Friday, or weekends Jenny Dalrymple-Hay on Beaconsfield (04946) 4579, quoting REF 5040.

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This interesting job at Wilson's Brewery demands a competent and intelligent computer operator with the ability to progress quickly towards the analysis, design and implementation of micro based projects. We currently use Data General Eclipse and Nova minicomputers and a range of IBM and Apple microcomputers. Aged around 25 you should have a good academic background (degree/National Diploma) and sound training in Management Services, Systems Analysis or programming. A two shift system is being worked - for which a shift premium is paid. An attractive salary is offered together with a discretionary bonus and the usual benefits associated with a progressive company. Write with full career and salary details to: Mr J.L. Dale, Senior Personnel Officer, Wilsons Brewery Limited, Monsall Road, Newton Heath, Manchester M10 8PA.

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CV's should be sent to: Mr M Walters,  
Tymshare Network Systems, Station House,  
Harrow Road, Wembley, Middlesex HA9 6EB.

(7547)

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As the Software Services Division of the UK's largest and most successful mini and mainframe manufacturer, our organisation offers you exceptional opportunities. In order to cater for the ever increasing demand for our services, we are, once again, seeking to recruit the highest calibre of D.P. Professionals to join our elite team.

In exchange for your valuable skills, we offer the opportunity to work with superb technical resources, many still unannounced, at the leading edge of major D.P. developments in the commercial world, first rate remuneration and a career structure designed to capitalise on your particular talents.

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**£8,000+ p.a.**

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The position involves user liaison, the writing of new systems and maintaining of current systems.

Benefits include 22 days holiday and pension scheme.

Please telephone Roger Strong, Computer Manager, on 01-640 1151.

(7498)

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## Digital Research

# European Product Development Manager

£20,000 + car

Digital Research is the world's leading supplier of microcomputer operating systems and program development tools.

As such it has established a network of European offices and distributors. To help it maintain its 100% per annum growth rate, the post of European Product Development Manager has been created. The responsibilities include:

- The internationalisation of software products, developed both locally and in the USA, on a country-by-country basis.
- The provision of strategic, technical and commercial input in the development or acquisition of software products.

As the successful candidate you will probably be educated to degree level. You will have a strong technical background preferably gained within a multinational supplier of semi-conductors/electronics/computers/peripherals or software.


The role demands an in-depth understanding of operating systems and compilers.

You will be capable of co-ordinating product development programs using contracted resources both in the UK and on the European continent. As it is European in scope a second language would be an advantage.

The remuneration package is highly attractive and includes a relocation package to the Digital Research west country headquarters where appropriate.

For further information please contact Tony McGrath or Karen Whelan on 01-637 9611  
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**MANAGEMENT & EXECUTIVE SELECTION**



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Work on a New Development Project. Our client, an international fast moving organisation, seeks to recruit Analyst/Programmers to be involved in the development of a new financial package. Company retains IBM 4300 running under MVS using COBOL CICS and DATABASE, along with various minis and micros. They offer variety, TRAINING in ANALYSIS, CICS & DATABASE, and development work. Applicants should have a minimum of 2 YEARS' IBM COBOL and be able to demonstrate enthusiasm.

## AN/PROG IBM COBOL

c.£13,000 + MORT.  
LONDON

Are you looking for a challenging position plus early promotion prospects. This leading International Bank in London seeks a confident individual with 2 years' IBM COBOL and preferably some involvement with CICS. They retain IBM 4300 hardware running under DOS/VSE using COBOL CICS and DL/1. You will be offered financial development projects, super working conditions and excellent perks including subsidised mortgage.

## SYSTEMS PROGS VAX MACRO

EEXC + MORT.  
LONDON

This International Financial Company based in the City can offer a high salary and full banking benefits for the successful candidates. You will need at least ONE YEAR'S VAX/VMS Systems Programming and ONE YEAR'S MACRO experience. Ideal applicants will have been involved with Systems Design and Implementation in a VAX/VMS environment. Phone now for further details.

## AN/PROG MICRO ASSEMBLER

to £14,000  
LONDON

We are currently seeking a Senior Analyst Programmer who has a minimum of 2 YEARS' ASSEMBLER with some exposure to COBOL, preferably gained in a MICRO environment. This is a leading position and offers responsibility for a large development area. The company also retains large IBM mainframes and minis and thus offers successful candidates the opportunity to gain varied experience with excellent promotion prospects.

## PROGRAMMERS IBM COBOL

to £12,000  
LONDON

Are you eager to develop new skills? This international company can offer TRAINING in CICS and DL/1. Applicants should have 18 months' IBM COBOL preferably with MVS, TSO, SPF and VSAM in a commercial environment. Our client is embarking on new development projects and can offer excellent career prospects. If you would like to work in this progressive environment phone now.

## AN/PROGS & PROGS IBM COBOL

to £14,000  
LONDON

Variety, opportunity, responsibility and security from a company dedicated to growth. If you are looking for responsibility and early promotion this leading Software House/Consultancy can offer you the rewards you deserve. In return you have a minimum of 2 YEARS' IBM COBOL with at least 6 MONTHS' CICS. This experience plus enthusiasm will be the key to your future.

aspect

242 9796

computer recruitment limited 15 Red Lion Square London WC1R 4QH. Telephone: 01-242 9796

## ICL SYSTEM 25

Our client, based in the Northern Home Counties, is a successful Systems House specialising in bespoke software for clients nationwide. They are now seeking to add to their highly successful team by recruiting the following people:

## Development Programmer £8½k - £12k

The successful applicant will have had 12-18 months experience on the System 25 and will preferably have also worked on the System 10. This is a senior position in a team engaged on development work within a variety of applications.

## Systems Designer £10k - £12k

With a solid background in design and analysis on the System 25, the person appointed will be responsible for developing bespoke systems and for designing solutions to clients problems that maximise the efficiency of the system. An ability to communicate effectively at all levels is essential. A Company Car is allocated to those who assume Management responsibilities.

If you want to join an expanding and highly successful organisation where you will be encouraged to develop your talents to the full then contact:

Lesley Thompson or Melanie Lindeman on 01-499 7761 daytime or 0494 31025 after 7.00pm.

Lloyd Chapman  
Associates

123, New Bond Street, London W1Y 0HR 01-499 7761

## SUPERB CONTRACTS FOR D.P. TRAINERS IN SAUDI ARABIA

SALARY £23-£26K

If you have at least 5 years' experience with large IBM Mainframes utilising such skills as PL1, TSO, SPF, etc, and more recently have been involved in D.P. training, you could be joining the education and development team of an international company that boasts one of the largest D.P. centres in the Middle East.

The ideal candidates should have proven D.P. training experience aligned to skills in one or more of the following areas: Course Structuring and Development, Audio and Visual Techniques, or Computer Based Training (CBT).

The successful applicants will be offered one year renewable contracts, and an extensive range of benefits commensurate with these challenging and rewarding positions.

Contact Peter Madams now for further details.



COMCAP RESOURCES LTD.

26 Chilworth Street, London W2 6DT  
Telephone: 01-723 4053 Telex: 897949

هذا من العمل

(7642)



## SYSTEMS + PROGRAMMING

### MVS SYSTEMS PROGRAMMER

**CITY** to £17,000 + MORTGAGE  
International bank in the City seeks an MVS Systems Programmer with experience of installing and maintaining MVS. Benefits include MORTGAGE subs., low interest loans and n/c pension. Ref. M2407

### SENIOR SYSTEMS ANALYST

**BERKS.** £13,000 + MORTGAGE  
As a result of recent conversion to IBM hardware, this international financial concern wishes to recruit a high calibre IBM Senior Systems Analyst. You will be supervising a project team monitoring progress and designing online systems. Benefits include MORTGAGE subs. and n/c pension. Ref. M2408

### PROGRAMMERS AND SENIOR PROGRAMMERS

**CENTRAL AND GREATER LONDON** to £13,000 + CAR  
Successful software house is seeking to recruit several experienced programming professionals to work on a variety of interesting projects at their prestigious client sites. Applicants should have a minimum of 18 months' COBOL experience. Ref. T2313

### ICL OPPORTUNITIES

**LONDON AND HOME COUNTIES** to £13,000  
We currently have a number of clients seeking to recruit ICL professionals. Opportunities exist within banking, manufacturing, commercial and bureau organisations. All positions offer short-term benefits and long-term prospects. Skills particularly in demand are knowledge of database and online techniques. Ref. D/Don

### HP3000 SENIOR ANALYST/PROGRAMMER

**CITY** to £13,000  
City company embarking on a new project wishes to recruit a Hewlett Packard Analyst/Programmer to join their small but progressive team. The successful applicant will have three-four years' HP3000 experience and good analysis skills. Excellent opportunity for the right candidate. Ref. T2389

### BASIC ANALYST/PROGRAMMER

**ESSEX** £12,000 + BENEFITS  
Professional commercial organisation with long term development plans is seeking to recruit a capable Analyst/Programmer with a good knowledge of Micro BASIC. Scope for involvement with a variety of interesting projects as a member of a friendly and expanding team. Ref. D2405

### SYSTEMS ANALYST

**SURREY** £12,000 + BENEFITS  
Leading UK company replacing batch with new real-time systems seeks to recruit an experienced Analyst to work as an integral part of development team. Benefits include n/c pension and BONUS. Ref. T2382

### SYSTEM 34 ANALYST/PROGRAMMER

**BERKS.** £12,000  
Progressive commercial concern is able to offer continuous challenge and involvement to an experienced Analyst/Programmer with a thorough grounding in both System 34 and RPGII. Some European travel. Ref. D2203

### FORTRAN PROGRAMMER

**SOUTH HERTS.** £Neg  
Leading computer services company wishes to recruit an experienced FORTRAN professional to assist in their expansion programme. Excellent salary and opportunities for European travel. Ref. T2409

### IBM COBOL ANALYST/PROGRAMMERS

**ESSEX** £9,500-£12,000  
Due to further computerisation of financial systems, this Essex-based manufacturing concern has a requirement for IBM Analysts/Programmers. Applicants should possess 18 months + IBM COBOL expertise. Training as required in CICS, DL/I and Analysis. Excellent career prospects and occasional overseas travel. Ref. M2235

### IBM COBOL PROGRAMMER

**CITY** £11,500 + MORTGAGE  
This financial concern retaining an IBM 3033 under MVS requires an IBM COBOL Programmer with two years' experience. Working within a project team, the successful candidate will be involved in online applications development. Benefits include MORTGAGE subs., low interest loans, n/c pension and BONUS. Ref. M2374

### RPGII/RPGIII

**C. LONDON** £11,000  
Due to consistent expansion, this leading systems house is currently seeking RPGII/III professionals with a minimum of 18 months' experience, preferably gained on GSD hardware. An ideal opportunity to broaden your experience within a purely development role. Ref. D2396

### ICL TPS PROGRAMMER

**CITY** to £10,500  
Outstanding opportunity for a Programmer with six months + TPS experience to join a major insurance company. Long term development plans and excellent career prospects for the successful candidate. Ref. D2404

### RPGII - RETRAIN TO RPGIII

**CITY** £10,000 + MORTGAGE  
Unique career opening for a competent RPGII Programmer with a minimum of 18 months' GSD experience to retrain in RPGIII and move into the exciting world of international banking. Excellent prospects and full range of banking benefits including a MORTGAGE subsidy. Ref. D2406

### CONTRACT

**IBM CICS COBOL PROGRAMMER** 6 months +  
**IBM MVS IBM COBOL PROGRAMMER** 3 months +  
**CITY SUSSEX** 6 months +

### COMPUTER TWO THOUSAND

**D.P. Recruitment Consultants**  
217-219 TOTTENHAM COURT ROAD  
LONDON W1P 9AF

(7568)

Tel: 01-636 7584 (24-hrs)

## PERSONAL COMPUTERS

# First Division Opportunities

My client is part of a diversified international group with a turnover in excess of £600 million. It is no stranger to the microcomputer market, from stand alone business systems to powerful supermicros. Based on this successful penetration, a new division has been formed to sell multiple IBM PC and Local Area Network configurations into substantial organisations. Using the Group's own IBM mainframe to demonstrate wide area communications is seen as a distinct competitive advantage.

### COMMUNICATIONS SPECIALIST up to £15,000

#### London and Home Counties

A software expert with hardware familiarity, you will provide both pre-sales and post-sales technical support to a small, professional sales team based in the Thames Valley. Initially covering

Southern England and the Midlands, you will encounter a broad range of proposed wide area communication systems. Training in IBM PC and state-of-the-art Local Area Network technology will be provided where necessary.

IBM mainframe environment and front-end communications experience, including 3270 and 3780, are essential. A technical background will encompass SNA/SDLC, BSC, and to a lesser extent, Systems 34, 36 or 38. Your brief will involve liaison at board level, so we will be looking for a mature approach, combined with effective presentation and demonstration skills.

This is a key appointment within a leading edge team, and career prospects are genuinely outstanding for the successful candidate when a national branch network is established. An attractive negotiable salary will be complemented by large company benefits. Ref. W1720.

### COMPUTER SALES PROFESSIONALS

on target £23,000+ car  
London, Bristol, Birmingham

We are also looking for hungry, achievement orientated sales people with the confidence and credibility to make major deals in the multi-user, multi-function market involving configurations from £20K to £100K.

Quite simply, this company does not believe in launching products unless they work. It is also committed to providing the very best in terms of professional support, including a 6-figure marketing budget and a first class training and development programme. Top players could easily be team leaders within 12 months. Ref. W1721.

If you're ready to join a First Division side, apply for a transfer now. Contact Peter Lloyd quoting the appropriate reference.

**01-242 9356 occ computer personnel**  
24 hour answering service Recruitment Consultants, Craven House, 121 Kingsway, London WC2B 6PA.

## OPPORTUNITIES IN THE SOUTH

### HEWLETT PACKARD - SENIOR

**C.£14,000**  
My client can offer a challenging job with excellent potential if you have over 7 years' D.P. experience, a sound knowledge of HP3000, and an independent personality with a desire to succeed. Based in London they are about to embark on many new development projects due to major company expansion. There are excellent prospects to become involved in analysis and project leading. Experience of FORTRAN, QUZ, QUICK or CUE would be assets but not essential. An excellent salary of £14,000 is offered - this could be increased for the right person. Ref. HW1010

### MOVE INTO ANALYSIS - RSTS/E TO £11,000

This is an excellent opportunity for a Programmer/Analyst to become more involved in systems design. You must be ambitious and display a thorough knowledge of DBC/DBP, RSTS/E and BASIC+. The company has a number of projects to be completed at the moment, covering all aspects of commercial applications. Lots of prospects for advancement. Based in the City. Ref. HW4115

### DEC - BANKING & FIVE FIGURES

If you are currently a DEC Analyst/Programmer, with BASIC+/V2 experience, preferably with a knowledge of banking - any London based client would like to meet you. They offer the chance to work on the latest DEC/VAX VMS machines, become involved in banking systems and also occasional world-wide travel. They offer an above average salary, combined with free BUPA, STL, 5 weeks' holiday and excellent profit share scheme. Too good to be true - call me now for more details. Ref. HW2707

### HEWLETT PACKARD - COBOL/SPL TO £9,000

Programmers and Analysts/Programmers are required by this expanding bureau organisation on the South/East. If you cannot see a position advertised for your particular skills, or are considering re-locating or a change of hardware, a quick phone call will put you in touch with a consultant specialising in your field. 70% of jobs in this industry are never advertised. Why not let us tell you about some of them? We look forward to hearing from you.

### ANALYST/PROGRAMMERS -

**DIBOL** £11,000  
This well-known development organisation based on the Surrey/Berks borders has a requirement for an Analyst/Programmer with either DBC PDF/VAX or Syntac experience to work on their new VAX systems. You must display a sound knowledge of DIBOL and be interested in moving into analysis, dealing with users, etc. I also have similar posts in London and East Surrey areas. Ref. HW2997

### COBOL PROGRAMMER/ANALYST SURREY

**£11,000**  
My client, one of the UK's largest and most successful trading groups, are entering a very exciting stage in the development of their computing facilities. For Programmers/Analysts with sound COBOL skills the opportunities are exceptional involving projects from initiation to implementation. Experience of Burroughs large systems is desirable with a minimum of 2 years' programming background and the potential to progress within the company. Flexitime, free lunch sports and social facilities are just some of the benefits plus excellent working environment. Ref. MW4241

### SYSTEMS ANALYST/DESIGNER SURREY

**TO £12,000**  
If you have a minimum of 2 years' analysis, preferably within a commercial environment and are looking to develop your skills, my client would like to hear from you. You must be able to work alone or as part of a team, and have designed and implemented at least one real time system through the feasibility stage. The company offer an excellent package and re-location expenses for the right applicant. Ref. HW4191

### TRAVEL COMPANY MIDDLESEX

**£9,500**  
Interesting opportunity for FORTRAN Programmer to develop your skills in an on-line environment dealing with reservation and travel applications. Initially you will work as a member of a small team and every opportunity for advancement will be available within this expanding D.P. department. The company utilises Perkin Elmer equipment and experience of this machine would be desirable. Benefits include free flights. Ref. MW4246

### WANG

**SURREY/LONDON TO £10,500**  
Well-established software house currently recruiting for versatile COBOL programmer with a minimum of 18 months' experience on interactive systems. They use various minis including WANG VS. This company in return offers interesting development work on various projects. Friendly environment and lots of prospects for self-motivated individuals. Ref. MW4244

### DATAPoint LONDON

**£9,500**  
An interesting opportunity has arisen with this major oil company for a Datapoint Programmer with good Datavue skills. Career opportunities within the group are excellent and they offer a full range of benefits commensurate with a prosperous organisation, plus the chance to eventually train on IBM kit. Ref. MW4245

### COBOL PROGRAMMER LONDON

**£8-10,000**  
An opportunity has arisen for an ambitious programmer to join a prosperous multinational organisation based in Central London. They require a minimum of 18 months' recent experience using any structured COBOL, knowledge of the UNIVAC 1100 being especially welcome. Just one of the many benefits in joining this company are the 1st class career prospects and training. If you are educated to graduate level and you are now looking for career advancement within a professional environment contact us now for further details. Ref. MW2744

### NCR ANALYST/PROGRAMMER MIDDLESEX

**£11,000**  
This large retail company require an experienced Database Programmer, with excellent analytical skills. The essential requirements are for someone with 2 years + NCR COBOL, preferably with accounts experience. This is an interesting and challenging position with lots of user liaison, so good communication skills are essential. The company offer excellent career prospects and plenty of development projects in the future. Ref. BW4184

### ICL PROGRAMMER/MOVE INTO ANALYSIS SURREY

**£9,000**  
This large household retail company is seeking a number of additional D.P. staff. If you can offer either 18 months' structured programming with a knowledge of TOTAL and/or RAMIS or over 2 years in an ICL COBOL environment and wish to move into analysis, this could be the post for you. The company offer the applicant the chance to work on a number of different mainframes and plenty of scope to advance in your career. Ref. BW4233

### HONEYWELL PROGRAMMERS

**£9,000**  
Excellent opportunity for a successful COBOL Programmer to work on new development projects, in a lively environment. Can you offer 2 years' COBOL as a Honeywell L64 site with TDS and on-line experience? Then I am sure you would benefit from a move to this prestigious company, who offer good promotion prospects and mortgage subsidy, life assurance and profit share scheme. Ref. BW2839

### ICL ME29 PROGRAMMER C.£9,000

I have two companies based in N.W. London offering an ambitious and keen young COBOL Programmer the opportunity to develop their skills. The successful applicant will have a minimum of 18 months' structured COBOL programming background, with either TMS or TPS on-line experience. The D.P. Department is fairly small but the company is experiencing excellent growth and is seeking a responsible individual to be in the start. Company benefits include holiday discounts and excellent career prospects. Ref. BW4227

### IBM SYSTEM 38 CITY

**TO £13,000**  
Exciting opportunity to get in at the start of a new IBM System 38 installation. Leading City brokers are seeking an Analyst/Programmer with a minimum of 3 years' RPG III or RPG II to take a senior role in the design and development of bespoke financial systems. A degree or equivalent would be advantageous, and the ability to liaise confidently with users. Benefits include BUPA and life insurance. Ref. CW2792

### IBM PROGRAMMER ESSEX

**TO £9,000 (+ OVERTIME)**  
A finance company in Essex urgently needs an IBM COBOL Programmer with 18 months + DOS/VSE or MVS experience. Knowledge of CICS, DL/I or IMS an advantage for development and support work. The many company benefits include mortgage subsidy, free life assurance and BUPA. Ref. BW4201

### RPG II/SYSTEM 34 & 38 TO £14,000 (+ BENEFITS)

Dynamic software house is looking for top-class RPG II Analysts/Programmers and Consultants, with a minimum of two and a half years' experience on System 34/36. You will have a choice of working in-house at their Middlesex offices, or on client sites throughout London and the West. At Consultant level, you must be able to assess client's business requirements and develop bespoke systems or tailor packages. Fabulous benefits including Co. Car at all levels. Ref. CW4138

### DL/I PROGRAMMER TO £12,000

Prestigious Central London site utilising twin IBM 4300s under DOS/VSE has a key role to fill. Three years + IBM COBOL with DL/I is essential, whilst CICS would be an advantage. You will be responsible for guiding the team in the technical aspects of DL/I, and developing a range of exciting systems including Point of Sale. Benefits include discount on products, profit sharing scheme and restaurant. Ref. CW4234

### IBM ANALYST/PROGRAMMERS HERTS

**TO £10,000**  
We need several Analysts/Programmers with design experience to work in a manufacturing environment in Herts. Minimum of 1 year's experience of IBM COBOL, MVS or DOS/VSE, CICS or DL/I. Excellent benefits. Ref. AW4199

These positions are just a brief selection from our extensive database of jobs in London and the South-East. If you cannot see a position advertised for your particular skills, or are considering re-locating or a change of hardware, a quick phone call will put you in touch with a consultant specialising in your field. 70% of jobs in this industry are never advertised. Why not let us tell you about some of them? We look forward to hearing from you.

## IBM OPPORTUNITIES

### ANALYST/PROGRAMMER £14,000

My client is a new installation situated in West London running an IBM 4331, with DOS/VSE, CICS. They are seeking a competent Analyst/Programmer with 4 years + IBM COBOL, and the ability to develop your analysis skills to the full. Any knowledge of RPG, CICS or financial applications would be highly advantageous. Benefits include 5 weeks' holiday and season ticket loan. Ref. CW4197

### IBM PROGRAMMER CITY

**TO £11,000**  
A City-based financial institution is looking to recruit a programmer with 2 years' IBM COBOL, DOS/VSE experience. Knowledge of CICS and DL/I would be highly advantageous. A high basic salary is offered along with mortgage subsidy, BUPA, LVs and Co Pension Scheme. Ref. AW4134

### IBM ANALYST/PROGRAMMERS HERTS

**TO £10,000**  
We need several Analysts/Programmers with design experience to work in a manufacturing environment in Herts. Minimum of 1 year's experience of IBM COBOL, MVS or DOS/VSE, CICS or DL/I. Excellent benefits. Ref. AW4199

### RPG III PROGRAMMER TO £9,500

Programmer required to join a small friendly team developing insurance and financial applications. Six months to 3 years' RPG III/Systems 34 experience preferred, but RPG II people will be considered, benefits include life insurance, LVs, 4 weeks' holiday. Ref. AW4211

### SYSTEM 34/36 ANALYST/PROGRAMMER

**£13,000**  
Opportunity for IBM system 34/36 RPG II person to develop analytical skills working for international financial institution in London. Great promotional prospects with the opportunity to travel and work abroad or re-locate in England if desired. All the usual perks of a large organisation. Ref. AW4103

### BANKING CITY

**C.£11,000**  
This leading international bank in the City require IBM System 34/RPG II Analysts/Programmers for their 1984 expansion plans. Ideally the candidates should have a minimum of 2 years' RPG II experience on IBM kit, financial or banking background would be an added advantage. Full range of banking benefits apply including a subsidised mortgage. Ref. GW1509

### S.W. LONDON/SURREY BORDERS

**IBM £10,000-£12,000**  
Excellent opportunity for successful IBM COBOL Programmer and Analyst/Programmer to join this dynamic software house. The company specialise in the area of conversion and development work on IBM 4300s. MVS or DOS/VSE experience is required with either on-line or Database experience. Excellent career path for keen ambitious D.P. professionals. Ref. GW1733

### SYSTEMS PROGRAMMER CITY

**£13,500 + MORTGAGE**  
My client (a major international bank) require a Systems Programmer to join a software support group embarking on major C.P.U. upgrades and DOS to MVS conversion. The ideal candidate will have at least 2 years' systems programming experience and will have worked in a MVS/SP environment. Knowledge of DOS/VSE and VM/CMS would be an advantage. Benefits include mortgage pension scheme, cheap loans and mortgage subsidy. Ref. GW2220

### IBM SYSTEM 38 ESSEX TO £11,500

A new C.S.D. site based in Essex are seeking to recruit Programmers and Analysts/Programmers with a minimum of 12 months' IBM Systems 38 RPG III experience. This is an international company with expanding offices within the UK. You will be involved with the development of major on-line systems. For the Analyst/Programmers positions, technical design experience is required. Interested? If so please telephone me to discuss these positions. Ref. GW4018

### PROGRAMMER/ANALYST WEST END

**C.£10,500**  
A genuine opportunity has arisen to become part of a challenging development team within this multi-national petroleum organisation situated in the West End. They require a programmer/analyst with IBM COBOL and MVS/SP background. CICS preferred although not essential. The company currently retain 2 x IBM 4341s but will be upgrading in the not too distant future. Working conditions and company benefits are excellent. Ref. GW4135

### SENIOR SYSTEMS PROGRAMMER

**CITY £16,000**  
Central London based engineering and construction firm needs a Senior Systems Programmer with a minimum of 4 years' experience. Applicants should have 2 years + MVS, JES2, IBM 3033. If you enjoy a challenge, give me a ring. Ref. CW4196

Brushfield House, 12 Brushfield Street  
Bishopsgate, London E1 6AN  
Telephone: 01-247 3356 (24 Hours)

**ENGLEDOWN**

(7568)

COMPUTER PERSONNEL CONSULTANTS

Brushfield House, 12 Brushfield Street  
Bishopsgate, London E1 6AN  
Telephone: 01-247 3356 (24 Hours)

**ENGLEDOWN**

(7568)

COMPUTER PERSONNEL CONSULTANTS

# COMPUTER DEVELOPMENT STAFF

ARE REQUIRED BY

## TRAVICOM

TO SUPPORT AN EXPANDING DEVELOPMENT PROGRAMME

Travicom is a Thames Valley based company involved in the provision of computerised facilities for the travel industry using the most up-to-date-micro computer and communications technology.

### OUR ACHIEVEMENTS TO DATE INCLUDE

- Linking 36 airlines to nearly 1,000 travel agency offices with lease line and dial up procedures, including the new Traveller Viewdata system.
- An automated airline ticket printer service.
- Interfacing airline systems with office-based computer systems.

### AN EXPANDED PROGRAMME FOR 1984/85 INCLUDES

- Connection to a new range of supplier host systems including car-hire and hotels.
- Implementation of a private X25 network to cover the United Kingdom.
- Enhancements to existing services.
- Further developments in ticketing and Viewdata services.
- Product marketing overseas.

Computer professionals are required to join the present experienced and highly motivated team based in Maidenhead. The staff likely to be selected will have a minimum of two years' experience in one or more of the following areas - Micro Computers, 'Unix', Programming in 'C' or Zilog Assembler, Communications Software, Terminal Systems or Airline Reservations.

Vacancies exist up to Team Leader/Senior Analyst level. Highly competitive salaries are offered and company benefits include free private medical insurance, life assurance, pension scheme, special holiday discounts, luncheon vouchers and 22 days' annual leave.

Please apply enclosing detailed cv to:

**Mrs J. L. Drake, Personnel Officer**  
**TRAVICOM**

13 Hermitage Parade, High Street, Ascot SL5 7HE  
or telephone Ascot (0990) 20175 for further information

(7858)

## OPERATORS

### IBM SYSTEM 38 (34) OPS.

£8,000+

NORTH LONDON - Due to expansion this large well-known company is currently seeking two IBM System 38 Operators; System 34 experience is advantageous. This installation utilizing IBM System 34 and 38 front ended by Series 1 are aiming to strengthen their existing operations team. Applicants should have the ability to work unsupervised to a tight schedule, with maturity and initiative. In return, you will enjoy job satisfaction through technical involvement in this busy, up-to-date environment. Company benefits include BUPA, pension scheme, subsidised restaurant, bonus scheme and generous holidays.

REF. A/148

### SYSTEM 34/38 OPERATIONS SUPERVISOR

£HIGH

NORTH LONDON - This large, well-known company is currently seeking an experienced Operations Supervisor who enjoys a challenging "up-to-date" environment. IBM System 34 or 38 experience plus proven supervisory skills coupled with the ability to work under pressure with competence and skill are essential. Successful applicants will enjoy job satisfaction through technical involvement and the opportunity to exercise supervisory skills in this rapidly expanding installation. Company benefits include BUPA, pension scheme, subsidised restaurant, bonus scheme, generous holidays etc.

REF. A/141

### VM/DOS OPS

£8-9,000

We are currently seeking Operators with six months + experience of VM DOS/VSE for various clients in London and the Home Counties. Please call the numbers below for more information.

REF. W/GEN 1

For more information on the above vacancies please call 01-637 1586 after 6 p.m. or on the numbers below during office hours.

(7858)



COMPUTER RECRUITMENT

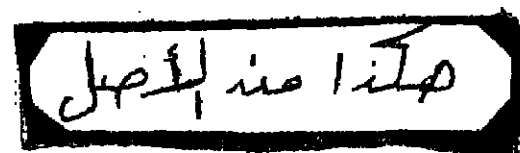
1-3 MORTIMER STREET, LONDON W1N 7BH

TEL 01-637 527701-636 4266

# Freelance Assignments

We need professional freelancers for the following projects  
in London and Home Counties

- ★ FOCUS - Snr. Programmers / Programmers
- ★ RAMIS - Database Designer / Analyst Programmers
- ★ UNIPAY - Expert (1 year contract)
- ★ FORTRAN / RSX - Snr. Analyst / Programmer (Banking)
- ★ DOS to MVS Conversion - PL / 1 Systems
- ★ MVS Customer Support - PL / 1 Systems
- ★ WANG - COBOL or PL / 1 Programmers



Please Ring: Sheila Fox  
**Link Associates Limited**  
Link House, Elgiva Lane, Chesham, Bucks.  
(0494) 784922



## FREELANCE ASSIGNMENTS CONTACT - BILL EVANS

### U.K.

#### PROGRAMMERS/ANALYSTS

3 months + Feb. start. IBM PL/1 & CICS.  
Experience. Development project.

#### SYSTEMS ENGINEERS

6 months + Feb/Mar start.  
Intel VAX - PLM. ASS, BASIC, CORAL or FORTRAN - Real Time  
Experience.

### HOLLAND

#### DESIGNER/PROGRAMMER/ANALYST

6 months + Feb start.  
DEC, PDP RSX - RTL 2

#### SENIOR PROGRAMMER

3 months + Feb/Mar start. DEC, PDP RSTS/RSX  
PASCAL Experience.

#### DATA BASE CONSULTANT/DESIGNER

6 mths. + Feb/Mar start. IDMS VSAM  
logical design experience.

### SAUDI ARABIA

#### VAX S/W SPECIALIST

12 mths. + Feb./Mar. start.

#### VAX OPERATIONS TRAINING INSTRUCTOR

12 mths. + Feb./Mar. start.

#### WANG H/W & S/W INSTALLER/SUPPORT SPECIALIST

12 mths. + Feb./Mar. start.

#### IBM PROGRAMMERS & ANALYSTS

12 mths. + Feb.-Apr. start. PLI, IMS,  
TSO/SPF experience.

For more details on the above and other scheduled assignments  
ring Bill NOW on 01-844-1722 or write enclosing detailed c.v.

(7882)



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JENRICK HOUSE, 4 HIGHFIELD ROAD, FELTHAM, MIDD. TW13 4DA



## Analyst Programmer

c.5500 p.a.

Northampton

★ Project Leader role

★ Expanding Company

★ Systems Development

★ Career Opportunity

We are a world renowned Company, possessing a range of products and specialist skills that have firmly placed us at the leading edge of our market. Consequently, our order books are continuing to be filled with major contracts from around the world and this, in turn, is demanding further expansion of our facilities in order to achieve our maximum potential.

Such growth, and the necessity to improve our efficiency, requires us to commence a programme of development that incorporates the computing strategy throughout the Company and the introduction of systems to improve and enhance those critical areas that require management control.

Our Hewlett Packard 3000 installation, encompassing the use of MM 3000 and real-time processing, is engaged in major systems development and has now reached the point where an experienced individual is required to fulfill a challenging and progressive role. You will be required to understudy our Management Services Manager and in so doing play a major part in project leadership, to enable the implementation of critical systems throughout the production and administration areas of the Company.

We are seeking an individual with the character and personality to assume responsibility at an early stage and to successfully liaise with users throughout the Company. Ideally you should possess Hewlett Packard experience and have followed a career path that encompasses either manufacturing or engineering environments and associated systems. Obviously, experience of Database, COBOL, and MRP would be highly advantageous. Candidates who feel that they have the required background, though perhaps developed on alternative systems, are still encouraged to apply.

Our growth could be the opportunity you have been seeking, to join a developing systems environment, which will lead to career progression over a suitable period. Employment benefits, including relocation assistance where applicable, match the position and Company.

Candidates should apply by telephoning Brian Harris on 021-236 3781 (24-hour answering service) or on 0788 77732 (evenings and weekends until 9pm).

Technical, Sales &amp; Management Appointments

(7814)

### Specialist Computer Recruitment Ltd

**SOUTH**  
James House, 46 James Street,  
London W1M 5HS  
01-838 0871/486 0461

**MIDLANDS & INTERNATIONAL**  
35-37 Great Charles Street,  
Queensway, Birmingham B3 3JY  
021-236 3781

**NORTH**  
International House, 84 Deansgate,  
Manchester M3 2ER  
061-833 0427

**BELGIUM**  
Avenue Louise 327,  
Boite 4, 1050 Bruxelles  
016 322-640 7151/71

**HOLLAND**  
Willemsparkweg 92,  
1071 H.M. Amsterdam  
010 3120-760947

# BALLOTTA INTERNATIONAL MIDDLE EAST Marketing Manager • CSE Manager • Sales Executives

## £15,000-£40,000 TAX FREE

### PLUS ACCOMMODATION, CAR OR CAR ALLOWANCE, FREIGHTS, MEDICAL INSURANCE, ETC.

#### MARKETING MANAGER

As the Marketing Manager you will be responsible for the overall marketing strategy of the company in the Middle East. You will be responsible for the development and implementation of the marketing plan, for the recruitment and training of the sales and marketing staff, and for the management of the sales and marketing budget. You will also be responsible for the development and implementation of the company's public relations and advertising strategy.

#### SALES EXECUTIVES

As a Sales Executive you will be responsible for the sale of the company's products and services to the clients in the Middle East. You will be responsible for the development and implementation of the sales strategy, for the recruitment and training of the sales staff, and for the management of the sales budget.

#### CSE MANAGER

As the CSE Manager you will be responsible for the overall management of the company's customer service in the Middle East. You will be responsible for the development and implementation of the customer service strategy, for the recruitment and training of the customer service staff, and for the management of the customer service budget.

For all positions it is essential to have the required sales, marketing, and engineering background, to handle the tasks described and to have worked on one or more of the range of Burroughs equipment.

The company offers a very attractive employment conditions and extremely good incentive bonus scheme. Married status may also be considered.



# QUALITY OF LIFE... & A CAREER TO MATCH

## There are many sound reasons for a move to the North West

### Consider these benefits:

- Where appropriate our client provides a generous and fully comprehensive relocation scheme.
  - Housing prices offer perhaps the best value for money in the country; this means a better more spacious family home, or cheaper rent for equivalent property.
  - Situated close to the countryside of rural Cheshire yet within easy reach of Manchester, there is a wide range of types of houses and communities in which to live.
  - Some of Britain's most inspiring National Parks and open spaces - including the Lakes, Snowdonia, Peak District are within easy access, made easier by the area's comprehensive motorway network.
  - Educational facilities, both for schooling and further education, are excellent in the area and the cost-of-living is appreciably lower than in the South.
  - Manchester is highly regarded as a centre for music, art and theatre, and recreational facilities abound - with many squash courts, golf courses and leisure centres within easy reach.
- In summary, you have an opportunity to make a significant improvement to the quality of life for you and your family.

## Hardware and Software Systems Engineers to £15K

Our client is a major force in real-time industrial control and communication and information systems, with exclusively non-military projects under development for clients around the world. Unprecedented international demand for their hardware and software products have created new positions at various levels and across a wide skill range. If you have worked on real-time applications, you must find out more about these exciting career opportunities. Ring Graham Pepper on 061-491 1666 (office hours) or at home on Adlington (0257) 480291. Alternatively, mail the coupon to FREEPOST, Computer People North, Sovereign House, Stockport Road, Cheadle, Cheshire, SK8 2YD.

Name \_\_\_\_\_ Address \_\_\_\_\_  
Tel (work) \_\_\_\_\_ (home) \_\_\_\_\_

**Computer People North**

01-836 8471 Computer People London, VII House, 48-49 St Martin's Lane, London WC2N 4JS • 01-480 4032 Computer People South, 27 George Street, Croydon CR0 1LB  
021-443 8501 Computer People Midlands, Alpha Tower, Birmingham B1 1TT • 041-491 1666 Computer People North, Sovereign House, Stockport Road, Cheadle, Cheshire SK8 2EA • 01-836 8411 Computer People International, VII House, 48-49 St Martin's Lane, London WC2N 4JS  
01-836 840 Computer People, VII House, 48-49 St Martin's Lane, London WC2N 4JS • 02-643 8732 Sales People, Alpha Tower, Birmingham B1 1TT • also offices in New York, Nashville and Los Angeles

**The Market Leaders**

ART WALLPAPERS TIMES FURNISHING THE GREAT UNIVERSAL STORES GROUP CAVENDISH WOODHOUSE HOME CHARM



**NOTTINGHAM**  
*the perfect setting for the latest in systems design*

The high reputation gained by the Great Universal Stores has been built upon solid foundations. Our systems are renowned for technical excellence which is a key factor in their success.

To ensure that growing demands do not sacrifice our high standards, GUS now seeks to recruit further:

### Systems Designers To \$11,000

If your career has included established programming skills in PL1, COBOL or BAL, the creation of program specifications and involvement in the areas of systems design, then you have the qualities we seek.

GUS can offer you the opportunity to broaden your responsibilities in these areas and to develop a potential future career path into Systems Analysis.

To find out more about the East Midlands most successful computer site, phone Phil Harkcom on 021 643 8501 (business hours) or 021 308 4285 (eves/weekends) or fill in and return the FREEPOST coupon to:

Computer People Midlands,  
Prepost, Alpha Tower,  
Birmingham B1 1BR.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
TEL (day) \_\_\_\_\_ (eves/wknds) \_\_\_\_\_

**Computer People Midlands**

CHESHIRE THE PRINTERS ALL COUNTIES INSURANCE C.C.N. SYSTEMS GENERAL GUARANTEE CORPORATION WHITEAWAY LAIDLAW BANK

## PUBLIC SECTOR APPOINTMENTS



**SOUTH NORFOLK DISTRICT COUNCIL**

### Post A Programmer/Analyst

Scale 6/SO1 (£8,154 to £9,660 p.a.)

### Post B Programmer (Temporary)

(For period of 18 months)

Scale 5/6 (£7,191 to £8,712)

Due to the development of our computer services we have vacancies for experienced Cobol programmers for an ambitious programme of developing on-line and batch systems for the ME29/45 computer and the development of other equipment, including ICL DRS 22/50 micros. All applicants should have a good academic background and personal qualities will include the ability to work to demanding timescales. Experience of RPG2, TME-TP, communications, IDMS and/or DDS will be advantageous. Appropriate training will be provided where necessary.

The posts are based at the modern, open plan Council offices at Long Stratton where working conditions include flexible working hours, staff restaurant and BUPA membership at reduced fees. Relocation expenses may be payable in appropriate circumstances. Application forms, together with further details (please state the post for which you wish to apply) are obtainable from:

Management Services and Personnel Officer,  
South Norfolk District Council, South Norfolk House, Swan Lane, Long Stratton, Norwich NR15 2XE (Tel: Long Stratton (0508) 31122).  
Closing date for applications - Friday, February 17th, 1984. (7573)

**RICHMOND UPON THAMES COLLEGE**  
Egerton Road, Twickenham, Middlesex

### TUTOR ANALYST/PROGRAMMER

Lecturer Scale 1

Richmond upon Thames College has an extensive range of computer hardware to provide an educational computer service to students and staff. This includes a PDP11 minicomputer plus many microcomputers. To expand our service we have created the above additional post for the Computer Unit.

Applicants are invited from persons with a solid computing background who are enthusiastic about combining practical computing with advising staff and teaching Computer Literacy. Although a teaching qualification is desirable it is not essential as teacher training can be provided.

Successful candidates must be willing to act as Collegium-tutors, teaching up to two hours of the tutorial curriculum weekly for mixed tutor groups.

Salary Scale: £5,945-£5,735 plus £246 Outer London Weighting Allowance per annum

Further articles and application forms, returnable within two weeks of the date of this advertisement, may be obtained from the Administrative Assistant, Personnel Section, Richmond upon Thames College, Egerton Road, Twickenham TW2 7SL (enclosed self-addressed envelope only).

**LONDON BOROUGH OF RICHMOND UPON THAMES** (75730)

London Borough of Ealing

### APPLICATIONS PROGRAMMER

Ealing College of Higher Education  
St. Mary's Road, Ealing W5  
£7,616-£8,520 pa inclusive

Required to join a team of two other programmers in providing a range of services to academic and administrative users. The centre provides an interactive computing service on Prime 760/560 as well as facilities on BBC and North Star micro computers.

Applicants should have a relevant degree and at least two years' practical experience, and preferably a good working knowledge of statistics. Please quote reference ED988.

Closing date 17/2/84.

Application forms and further details from the Chief Administrative Officer (TD/UC), E.C.H.E., St. Mary's Road, London W5 8RF. Telephone: 01 574 4111. (75471)

**GLC**

Working for London

## Computer Applications Manager

### Architecture & Civic Design

The Architect's Department's Computer Group is active in a wide range of computer-based administrative financial systems. It is responsible for the largest computer-aided design installation within the European construction industry.

The Manager's role includes establishing forward organisational and resource requirements for the Department, carrying out appraisals and feasibility studies and providing technical support to reports. This post also carries responsibility for new technology applications and developments and will involve close liaison with the Central Computer Service.

A broad-based computing background is required, with good communication skills and the capacity to understand and interpret the specific needs of specialist professional areas. This post is suitable for job sharing.

Salary: £34,349-£35,612 inclusive.  
For an application form, to be returned by 17th February 1984, write to: Establishment Division, Department of Architecture and Civic Design, Ref: 01/7, Greater London Council, Room 469 North Block, The County Hall, SE1 7PB or telephone 01-633 7417.

The GLC welcomes applicants from all sections of the community, irrespective of their sex, ethnic origin, colour, sexual orientation or disability, if they have the necessary attributes to do the job.

The GLC is an equal opportunities employer.

## Shift leader

### IBM experience in Brighton

Up to £8883 p.a. inclusive of shift allowance, to lead a team of computer operators on an IBM 4331-2 running under VM/SP with DOS/VSE, POWER, CICS, DL1 and CMS.

You should have considerable technical expertise and applications are particularly welcome from those with experience of our equipment and software, but we require a minimum of 18 months' operations experience. Preference will be given to those with supervisory skills or experience.

Two shift system, early start at 07.30 and finish up to 23.30.

Generous relocation allowances include a grant of up to £3750 plus full reimbursement, removal costs, lodging and travelling allowances.

Please telephone Brighton (0273) 29801 extension 486 for an application form or write to the Borough Treasurer, PO Box 4, Town Hall, Brighton BN1 1JA.

Closing date 17th February.

Borough of

**Brighton**

## SHEFFIELD CITY POLYTECHNIC

### COMPUTER SERVICES DEPARTMENT

### PROGRAMMER (SYSTEMS PROGRAMMING SECTION)

Scale 5/6 £7,191-£8,712

A Programmer is needed to work as a member of a team responsible for operating system support on the IBM 4341 under VM/CMS. The team is also involved in support of microcomputer systems software and data communications.

Applicants should have previous systems support experience, including IBM 370 Assembly language programming, and should preferably have a degree level qualification.

APPLICATION FORMS AND FURTHER DETAILS FROM THE PERSONNEL DEPARTMENT, SHEFFIELD CITY POLYTECHNIC, HALFORDS HOUSE, 14 FITZALAN SQUARE, SHEFFIELD S1 2BB. TEL: 0742 22911, EXT. 2381. PLEASE QUOTE POST NO. 6825. CLOSING DATE FEBRUARY 17th.

Sheffield City Polytechnic is an equal opportunities employer.

(75481)

## HALTON BOROUGH COUNCIL

Chief Finance Officers Dept Post Number 87

### Operations and Network Controller

Grade SO 1/2 - £9,060 - £10,539

Applications are invited for the above position which is based in the municipal building, Widnes.

It is a new post, reporting and responsible to the Computer Manager. For the post, the Controller will be responsible for the operation and maintenance of the Council's computer system, including mainframe, data control and terminal network. The Council provides a service not only to its own departments but also to Warrington and Halton Development Corporation.

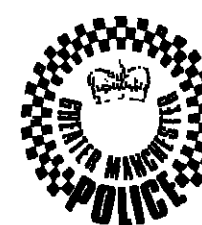
The Council has recently installed an ME 29 model 84 computer, supporting a comprehensive terminal network at several locations.

Several years experience in a Computer Operations Department is required, preferably on ICL ME 28 equipment. A sound knowledge of hardware, software and communications is essential, while experience of the management and control of staff is desirable.

Application forms and job descriptions may be obtained from the Head of Personnel and Management Services (Tel: 051-428 2951, ext. 148) and should be returned no later than 17th February 1984. (7553)

## POLICE COMPUTING - MANCHESTER

### up to £11,703



Greater Manchester Police is one of the largest Forces in the country with a comprehensive programme of computerisation.

The Force is currently installing a major computer system based on Tandem hardware incorporating criminal records, message switching and an associated data network linking Headquarters to divisions and sub-divisions.

The Force is also in the process of installing, developing or planning a number of other administrative and operational systems.

To play an important role in these developments there are a number of posts:

## SYSTEMS ANALYST

## ANALYST/PROGRAMMER

## PROGRAMMER

P01/2  
P01  
S01/2

Salaries within the range £9,060-£11,703.

The Systems Analyst will work on departmental management systems. Experience of mini and microcomputer systems is desirable and implementation experience must be demonstrable. About six years' D.P. experience is required.

The Analyst/Programmer will work on operational systems. You should have experience of large databases using fast response on-line systems, together with about four years' D.P. experience.

The Programmer will assist the above posts. Experience of a commercial language is essential and the use of a microcomputer language would be desirable.

The posts, although on the County Treasurer's establishment, are within the Police Computer Projects Branch which is based at Force Headquarters in Trafford, Manchester. For an informal discussion phone Andy Softley, Project Leader, on 061-872 5050 extn. 2782.

Application form, job description and further details available from the County Treasurer, Greater Manchester Council, Piccadilly Gardens, Manchester M60 3HR.

Closing date 15th February 1984. (75461)

## Newcastle Upon Tyne Polytechnic

### COMPUTER UNIT

### PROGRAMMER/ANALYST

Scale 5/6

Ref. No: APC 5/84

To design, specify and implement computer programs and packages across a wide range of applications. Candidates will be assessed on a combination of a degree, professional qualification and relevant experience.

NJC Salary and Conditions £7,191-£8,712 per annum.

For further details and application forms please call our 24 hour telephone answering service 0832 323126 or write enclosing a stamped addressed foolscap envelope to Mrs Rosemary Smith, Administrative Assistant (Recruitment), Newcastle upon Tyne Polytechnic, Ellison Place, Newcastle upon Tyne NE1 6ST, to whom completed forms should be returned quoting the reference number by February 17th, 1984. (7546)

These projects require able professional project leaders who are capable of controlling teams of analysts and programmers who have the ability to plan and execute high quality work and liaise directly with different client groups within the NHS.

Vacancies have arisen for such staff, based in Birmingham. If you feel that your career has led you to the position where you can handle real responsibility, please send now for an application form from: West Midlands Regional Health Authority, Personnel Division, 1st floor, Cumberland House, 200 Broad Street, Birmingham B15 1SW. Tel: 021-643 5761, ext. 41.

Closing date for receipt of completed applications, February 23rd, 1984. (7538)

## NHS COMPUTING - PROJECT LEADERS

Grade: Scale 14

Salary £5,404-£11,434 (new entrants to the NHS normally commence on the minimum of the salary scale)

The management Services Division of the West Midlands Regional Health Authority is responsible for many computing projects both within the Region and nationally, using CL mainframe computers and a wide variety of mini and micro computers.

These projects require able professional project leaders who are capable of controlling teams of analysts and programmers who have the ability to plan and execute high quality work and liaise directly with different client groups within the NHS.

Vacancies have arisen for such staff, based in Birmingham. If you feel that your career has led you to the position where you can handle real responsibility, please send now for an application form from: West Midlands Regional Health Authority, Personnel Division, 1st floor, Cumberland House, 200 Broad Street, Birmingham B15 1SW. Tel: 021-643 5761, ext. 41.

Closing date for receipt of completed applications, February 23rd, 1984. (7538)

## FOR CLASSIFIED ADVERTISING USE DIRECT LINES

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DIRECT ADVERTISERS (01) 661 8080

## UNIVERSITY OF LIVERPOOL

Department of Computer Science

### EXPERIMENTAL OFFICER

To join small team which provides software and hardware support for teaching and research. Experience of local area networks, assembly language programming, UNIX, Algol 68, or Pascal particularly welcome.

Candidates should possess an Honours degree in Computer Science, or have appropriate equivalent professional qualifications.

Salary within range £6,310-£8,530 per annum.

Application forms may be obtained from the Registrar, The University, P.O. Box 147, Liverpool L69 3BX. Quote Ref: RV/215/CW. (7532)

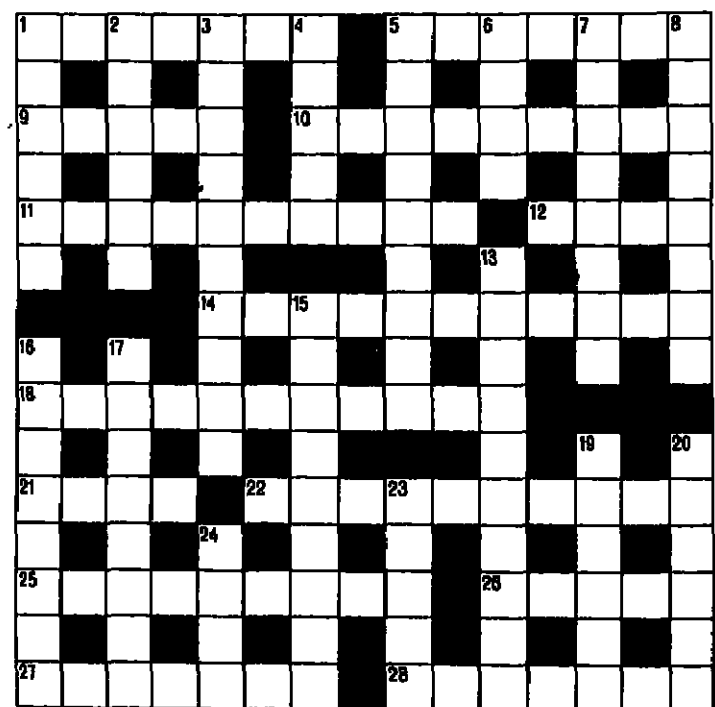


## CROSSWORD

## Prize Crossword No 49

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, by first post Friday, February 10. Please use a bullpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name ..... (Miss, Mrs, Ms, Mr)

Address .....

Telephone .....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed ..... Date .....

- ACROSS**
- 1 Begin hostilities, having gained nothing by crude back-tracking (2,2,3)
  - 5 Famous Chapel is located in highway in the East (7)
  - 9 Capital from national coffers for informers (5)
  - 10 See playful dog drowned by ill-fortune in sluice (9)
  - 11 A new rising impulse noticeable in the screen, somehow (10)
  - 12 Soldier, a paragon of virtue, makes a point (4)
  - 14 Utterly opposed to obsolete endearment profits (4,7)
  - 18 I'm a star of the stage - you may find me ideal on it (7,4)
  - 21 Admits urban communities are leaderless (4)
  - 22 Awfully potty sec, eastern, the conventional model (10)
  - 25 Hints given by one head in a drunken condition (9)
  - 26 Composes, we hear, liturgies (5)
  - 27 Objectionable people beginning to revile fish-eaters (7)
  - 28 Secret agent, losing heart, checks plans (7)
- DOWN**
- 1 Those in a certain class get inside information before test (6)
  - 2 Bird responsible for the endless stampede (6)
  - 3 You and I stepping out in part of Yorkshire (4,6)
  - 4 Plunder obtained with firearm (5)
  - 5,6 A drink to frustrate one gets Dad so vexed (6,3,4)
  - 7 Europeans upset a sluggish person at one (8)
  - 8 A blissful place, an art gallery, causing sloth, perhaps (8)
  - 13 Appeal for recruits, or invitation to a cuddle? (4,2,4)
  - 15 Sal enters carelessly, but vigilance is needed (9)
  - 16 I buy stuff from abroad - I'm getting malt beer (8)
  - 17 Stick to your principles and treat an Irishman to a drink? (5,3)
  - 19 Attempt to climb in a tree upside down - an evergreen (6)
  - 20 Exploits around Society resulting in festivities (6)
  - 23 King has recourse to strata-gems (5)
  - 24 Penalty that's over-elaborate (4)

## RULES AND CONDITIONS

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly with the exception of the staff of Business Press International Ltd, any printers employed by them or the relatives of any such staff.
3. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.
4. Winners will receive their prizes during the month following the competition.
5. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.

## ENGINEER YOUR CAREER

## TRAIN IN THE U.S.A. ... AND TAKE YOUR FAMILY WITH YOU

Earn between £10K and £14K Basic + O.T. + Standby  
Drive a 2-litre GL company car - private petrol paid

Field Service Engineers with a good knowledge of minis/mainframes are offered the opportunity to work for this world-leading manufacturer of non-stop processing minicomputer equipment.

## INTERESTED IN CAD/CAM?

Basic Salaries to £11K + 2-litre car + all benefits  
Substantial growth (80% p.a.) has now created a number of vacancies throughout the UK. Our client can proudly boast that they are the world leaders in the manufacture of CAD/CAM mini computer systems.

## JUST STARTING OUT?

Working Essex, Scotland, Hertford, Hampshire  
Would you like the opportunity to get your foot in the door of the computer industry? Our Client, a major micro manufacturer can give you the key.

Phone JACKIE WOOD on 01-543 4844 days or  
0403-88888 Even/Weekends

ALLTRONICS PEOPLE (AGY)

(7667)

## PROGRAMMING PROFESSIONALS

LSI Logic Limited (a leader in the design and manufacture of custom and semi-custom integrated circuits) has established a design centre and development laboratory in Bracknell. There are immediate openings for qualified professionals seeking a career in state of the art software development.

## Our requirements include:

- BSc or Higher Degree in Computer Science or related field.
- Familiarity with modern programming languages (PASCAL, C, PL/1).
- Strong background in compiler design and implementation.
- Familiarity and experience with IBM/370 architecture and instruction set and the VM/370 operating system.

This group will initially be engaged in development of a new compiler for the C language to operate efficiently in the IBM/370 environment under the VM/370 operating system. Emphasis will be placed on compatibility with other C compilers (UNIX, VAX/VMS, etc.) and efficiency of generated code. Experienced individuals are required for both the 'front end' (Syntax Analysis and Parsing) and 'back end' (Code Generation and Optimisation) portions of the project.

Individuals selected for these positions will spend several weeks at LSI Logic Corporation in California to become familiar with the LDS (LSI Design System) and the technical requirements of the project. It is planned that the Bracknell Development Laboratory will make major contributions to LSI Logics ongoing worldwide CAD capabilities.

LSI Logic is in the forefront of both IC technology and design automation software and believes in providing a well-supported environment for its programming staff. Our Bracknell Design Centre includes an on-site Amdahl V6 computer running the VM/370 operating system, with a dedicated, locally attached 3270 compatible terminal provided for each programmer. In addition, a satellite links the Bracknell Design Centre to the main computer facility (an IBM 3081K) in California's 'Silicon Valley'.

If you have the qualifications for these positions, please send your résumé to:

Svein Davidsen, General Manager  
LSI LOGIC LIMITED  
Grenville Place, The Ring  
Bracknell, Berks RG12 1BP

(7653)

## DIRECT MUMPS CONTRACTS

West End travel company require Mumps Contract Programmers to work at their offices in London W8.

- BEST RATES AVAILABLE -  
Applicants must have experience of DSM-11.

For more details contact Colin Jardine on 01-222 8300 NOW.  
(7648)

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## We've got the right reasons for going contract...

Whether you're an established contractor already, or contemplating going contract for the first time, the excellent salary rates are an obvious attraction. However, we at Lorien believe there are many other good reasons for going contract - the right reasons. Many of our contractors have been with us for several years, and with good reason. Our large blue chip client base can provide a high level of security, tremendous variety and ensure that technically you keep abreast of advances within the industry - and our highly experienced consultants match your skills to the right contract. Why not discover the reasons for yourself why Lorien are so good for contractors?

## Southern Contracts

IBM System 38  
PROGRAMMER French speaking PARIS  
PROGRAMMER RPG III for Bank in the City  
PROGRAMMERS RPG III Commercial  
LONDON  
PROGRAMMERS RPG III Commercial  
SOUTH, WALES, MIDLANDS  
Telephone Nick Clements

We have many contract requirements suitable for first time or experienced contractors. These are located throughout the South of England, including London, with immediate and future start dates. Our consultants will be delighted to discuss these exciting prospects with you.

**Lorien**  
COMPUTER SERVICES LTD.  
We've got it!

LORIEN COMPUTER SERVICES LTD  
Recruitment Consultants Greencoat House  
Francis Street London SW1P 1DH 01-630 1435

SMR  
Sales & Marketing Recruiters Ltd  
Leaders in High Technology RecruitmentMICROCOMPUTERS  
SALES AND  
SALES SUPPORT  
THIS COULD BE THE START OF  
SOMETHING BIG!

Probably the most sought after job opportunities as far as accomplished and ambitious salespeople are concerned is the chance to join a major foreign company with an outstanding product range who is just setting-up in the U.K. The implications of the 'ground floor opportunity' are obvious. However it is not very often that such a situation occurs involving a multi-national company with revenues in excess of £500 millions and employing over 25,000 people worldwide!

So determined is our client to succeed, that the investment in U.K. manufacturing facilities has trebled within the last two years. Early success has already been achieved and the product/quality performance may be judged by its rapid revenue growth.

This company is about to launch a powerful range of home and business microcomputers with performance and prices that will amaze you, supported by application packages and a comprehensive range of languages, system utilities and operating software.

Requirements now exist

## THROUGHOUT THE U.K.

## AREA SALES MANAGERS

Candidates should be directly experienced and successful salespeople who are currently selling microcomputers to Dealers, Distributors, Specialist Computer Retailers, Major End-Users, etc. They will be self-motivated and industrious individuals, able to create and implement sales strategy and manage a small team of sales and technical support people. An attractive compensation package will be offered including a guarantee against commission earnings and a company car is provided. Territories are available throughout the U.K.

## SALES SUPPORT ANALYSTS

Candidates should have substantial experience of either the business or home microcomputer market and able to handle the technical requirements of distributors, retailers and large-scale end-users. Knowledge of CPM and BASIC is essential and fluency in commercial applications will be advantageous. Opportunities exist throughout the U.K., an attractive salary will be paid and a company car is provided.

## SALES TRAINEES

These opportunities will appeal to those young people with obvious flair for selling who have significant experience of utilising microcomputers or are already involved in marketing or merchandising to distributors, retailers, etc. The job entails the provision of sales and marketing support, including the operation of varied promotional campaigns to a wide selection of clients and reports to the local Area Sales Manager. Opportunities exist throughout the U.K., an attractive salary will be paid and a company car is provided.

All these excellent job opportunities carry considerable fringe benefits, a company pension, but above all they offer considerable potential for job satisfaction, high earnings and career advancement.

Please provide complete career details to Roger Dodd (Midlands and North) and Lindsay Howie (South) quoting reference SDB/024.

## LONDON &amp; SOUTH

23 Oxford Street  
London W1 (01) 734 97/6

## MIDLANDS &amp; NORTH

Cathedral House, Beacon Street  
Lichfield, Staffs. (05432) 56612

Answering Service after 6pm and weekends  
SALES TRAINING, MARKET RESEARCH, RECRUITMENT

Quality of Management - 81

## Know-how is not enough - you need to pass it on

A REGULAR arrival at Sales and Marketing Recruiters is the aspiring sales trainee; young people trying to get into selling.

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More often than not, we are unable to offer them any direct opportunities of employment, but we are always happy to point them towards those companies which have the resources, commitment and long-standing reputation of providing effective selling training for people who are new to selling.

Among those we normally recommend as having the best understanding of the fundamental needs of such people are British Olivetti, Burroughs, Kalamazoo and Rank Xerox, all of which have

and inadequacy. Occasionally some get lucky and take over from a sales manager who has left in order to continue his climb to further stardom, leaving behind him a well-trained, highly motivated and disciplined team.

Much more likely, however, is that the manager departed because the managing director thought it might be a good idea.

So there you are, with your motley crew, 'til head-hunter or size 10 boot do you part. So what comes next?

For a start you need to make sure everybody in the team is singing from the same hymn book. Everyone must have a clear understanding of the marketplace, the product, the competition, and above all the way your particular product should be sold relative to the personality of the individual.

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So I was extremely surprised to receive a telephone call the other day from an employee of one of these companies asking if we could provide her with some sales training. 'Talk about coal to Newcastle!'

It transpired that we were discussing a classic sales management shortfall - that is, the lack of acceptance, or realisation that sales training (like recruitment) is a continuing process; that well established and proven salespeople have as great, albeit different, a need as new recruits for training.

Continuous training is a fundamental part of their professional occupation.

For many companies, sales training is something one is obliged to give to trainees and new recruits, and even then it is a task preferably offloaded to an external agency if at all possible.

Continuity and commitment don't come into it. It is treated more like an unavoidable nuisance than an integral and stimulating part of sales management.

The 'caller' explained that she was selling an excellent and highly technical product for a first-class company with which she had been employed for many years and where she was happy to continue.

The only problem was that for its established salespeople replenishment sales training was non-existent, and competition and product-related training occurred only when it could not be put off any longer.

This she found not only demotivating, but a considerable handicap within a competitive marketplace.

This prompted me to return to the subject of training, having spent some time in discussing the merits of field training.

Few sales managers have the good fortune and experience of setting up a sales team from scratch. More often than not they take over a legacy of management neglect

Alan Williams

## PUZZLE ANSWER

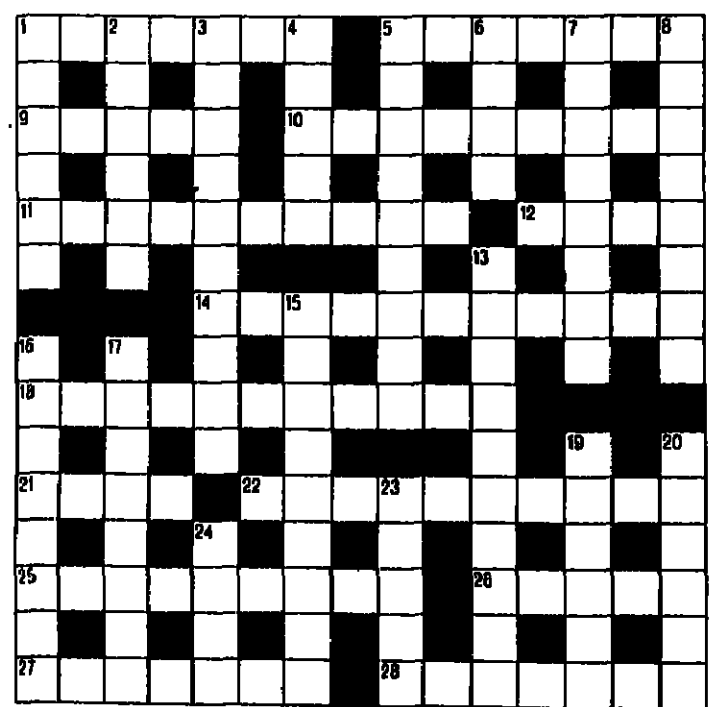
IT is clear that whichever man served first he could not have won all five of his service games, since this would allow for no 'breaks' by his opponent. So it is fair to assume that the first server won only 4 of his service games - and fair also to say that he must have won some (say 2) of the other four games. This gives a total of (5-4)+4 for the number of games lost by both servers together. But this total is known to equal 5, so must actually equal 4. The inference therefore is that the first server must have won an even number of games, and so it must have been X who served first.

## CROSSWORD

## Prize Crossword No 49

Compiled by Alec Robins

A prize of £10 will be awarded for the first correct entry opened. The second and third solutions opened will receive £5 each. Entries to Crossword Competition, Computer Weekly, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS, by first post Friday, February 10. Please use a ballpoint to complete the crossword, and include a telephone number at which you can be reached during the daytime.



Name ..... (Miss, Mrs, Ms, Mr)

Address .....

Telephone .....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed ..... Date .....

## ACROSS

- 1 Begin hostilities, having gained nothing by crude back-tracking (2,2,3)
- 5 Famous Chapel is located in highway in the East (7)
- 9 Capital from national coffers for informers (5)
- 10 See playful dog drowned by ill-fortune in sluice (9)
- 11 A new rising impulse noticeable in the screen, somehow (10)
- 12 Soldier, a paragon of virtue, makes a point (4)
- 14 Utterly opposed to obsolete 'telegenic' profits (4,7)
- 18 I'm a star of the stage - you may find me ideal on it (7,4)
- 21 Admits urban communities are leaderless (4)
- 22 Awfully potty seer, eastern, the conventional model (10)
- 25 Hints given by one head in a drunken condition (9)
- 26 Composes, we hear, liturgies (5)
- 27 Objectionable people beginning to revile fish-eaters (7)
- 28 Secret agent, losing heart, checks plans (7)

## DOWN

- 1 Those in a certain class get inside information before test (6)
- 2 Bird responsible for the endless stampede (6)
- 3 You and I stepping out in part of Yorkshire (4,6)
- 4 Plunder obtained with firearm (5)
- 5,6 A drink to frustrate one gets Dad so vexed (6,3,4)
- 7 Europeans upset a sluggish person at one (8)
- 8 A blissful place, an art gallery, causing sloth, perhaps (8)
- 13 Appeal for recruits, or invitation to a cuddle? (4,2,4)
- 15 Sal enters carelessly, but vigilance is needed (9)
- 16 I buy stuff from abroad - I'm getting milk beer (8)
- 17 Stick to your principles and treat an Irishman to a drink? (5,3)
- 19 Attempt to climb in a tree upside down - an evergreen (6)
- 20 Exploits around Society resulting in festivities (6)
- 23 King has recourse to stratagems (5)
- 24 Penalty that's over-elaborate (4)

## RULES AND CONDITIONS

1. Each competitor may submit no more than one entry.
2. The competition is open to all readers of Computer Weekly with the exception of the staff of Business Press International Ltd, any printers employed by them or the relatives of any such staff.
3. The decision of the editor on the interpretation of the rules and conditions and on all matters shall be final. No correspondence will be entered into.
4. Winners will receive their prizes during the month following the competition.
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LSI Logic Limited (a leader in the design and manufacture of custom and semi-custom integrated circuits) has established a design centre and development laboratory in Bracknell. There are immediate openings for qualified professionals seeking a career in state of the art software development.

Our requirements include:

- BSc or Higher Degree in Computer Science or related field.
- Familiarity with modern programming languages (PASCAL, C, PL/1).
- Strong background in compiler design and implementation.
- Familiarity and experience with IBM/370 architecture and instruction set and the VM/370 operating system.

This group will initially be engaged in development of a new compiler for the C language to operate efficiently in the IBM/370 environment under the VM/370 operating system. Emphasis will be placed on compatibility with other C compilers (UNIX, VAX/VMS, etc.) and efficiency of generated code. Experienced individuals are required for both the 'front end' (Syntax Analysis and Parsing) and 'back end' (Code Generation and Optimisation) portions of the project.

Individuals selected for these positions will spend several weeks at LSI Logic Corporation in California to become familiar with the LDS (LSI Design System) and the technical requirements of the project. It is planned that the Bracknell Development Laboratory will make major contributions to LSI Logics ongoing worldwide CAD capabilities.

LSI Logic is in the forefront of both IC technology and design automation software and believes in providing a well-supported environment for its programming staff. Our Bracknell Design Centre includes an on-site Amdahl V6 computer running the VM/370 operating system, with a dedicated, locally attached 3270 compatible terminal provided for each programmer. In addition, a satellite links the Bracknell Design Centre to the main computer facility (an IBM 3081K) in California's 'Silicon Valley'.

If you have the qualifications for these positions, please send your résumé to:

Svein Davidson, General Manager  
LSI LOGIC LIMITED  
Grenville Place, The Ring  
Bracknell, Berks RG12 1BP

(7082)

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SOMETHING BIG!

Probably the most sought after job opportunities as far as accomplished and ambitious salespeople are concerned is the chance to join a major foreign company with an outstanding product range who is just setting-up in the U.K. The implications of the 'ground floor opportunity' are obvious. However it is not very often that such a situation occurs involving a multi-national company with revenues in excess of £500 millions and employing over 25,000 people worldwide!

So determined is our client to succeed, that the investment in U.K. manufacturing facilities has trebled within the last two years. Early success has already been achieved and the product/quality performance may be judged by its rapid revenue growth.

This company is about to launch a powerful range of home and business microcomputers with performance and prices that will amaze you, supported by application packages and a comprehensive range of languages, system utilities and operating software.

Requirements now exist

## THROUGHOUT THE U.K.

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Candidates should be directly experienced and successful salespeople who are currently selling microcomputers to Dealers, Distributors, Specialist Computer Retailers, Major End-Users, etc. They will be self-motivated and industrious individuals, able to create and implement sales strategy and manage a small team of sales and technical support people. An attractive compensation package will be offered including a guarantee against commission earnings and a company car is provided. Territories are available throughout the U.K.

## SALES SUPPORT ANALYSTS

Candidates should have substantial experience of either the business or home microcomputer market and able to handle the technical requirements of distributors, retailers, and large-scale end-users. Knowledge of CPM and BASIC is essential and fluency in commercial applications will be advantageous. Opportunities exist throughout the U.K., an attractive salary will be paid and a company car is provided.

## SALES TRAINEES

These opportunities will appeal to those young people with obvious flair for selling who have significant experience of utilising microcomputers or are already involved in marketing or merchandising to distributors, retailers, etc. The job entails the provision of sales and marketing support, including the operation of varied promotional campaigns to a wide selection of clients and reports to the local Area Sales Manager. Opportunities exist throughout the U.K., an attractive salary will be paid and a company car is provided.

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Please provide complete career details to: Roger Dodd (Midlands and North) and Lindsay Howie (South) quoting reference SDB/024.

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## SALES BIT

Quality of Management - 81

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The next problem is how to go

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Few sales managers have the good fortune and experience of setting up a sales team from scratch. More often than not they take over a 'legacy' of management, neglect

about it.

Whether you use an external agency or do it yourself, it is not as important as establishing what kind of training is needed and accepting the commitment to do it.

This training should be relevant, not only now, but on a continuing basis for the foreseeable future.

In other words, don't merely think about the training that is required now. Consider also what will be needed throughout the coming year.

In the educational process, merely having the information is not sufficient in itself. Knowing how to convey it to others is what really counts.

Teaching is a very special skill that should not be underrated but respected.

The principal areas of training for salespeople are product knowledge, selling skills, knowing the competition, and knowing the customer.

Next week I would like to continue by highlighting some of the primary considerations related to these key areas, as they apply to the growth of the individual salesperson.

Alan Williams

## PUZZLE ANSWER

It is clear that whichever man served first he could not have won all five of his service games, since this would allow for no "breaks" by his opponent. So it is fair to assume that the first server won only  $n$  of his service games - and fair also to say that he must have won some (say  $m$ ) of the other four games. This gives a total of  $(5-n)+m$  for the number of games lost by both servers together. But this total is known to equal 5, so  $m$  must actually equal  $n$ . The inference therefore is that the first server must have won an even number of games, and so it must have been X who served first.